DOCUMENT RESUME

ED 457 822 IR 020 892

AUTHOR Fuller, Frank, Ed.; McBride, Ron, Ed.
TITLE Distance Education. [SITE 2001 Section].
PUB DATE 2001-03-00
NOTE 203p.; In: Proceedings of Society for Information Technology & Teacher Education International Conference (12th, Orlando, Florida, March 5-10, 2001); see IR 020 890. Figures may contain very small and illegible font.
PUB TYPE Collected Works - General (020) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC09 Plus Postage.
DESCRIPTORS *Computer Uses in Education; *Distance Education; *Educational Technology; Elementary Secondary Education; Higher Education; Preservice Teacher Education; Technology Integration
IDENTIFIERS Technology Utilization; Web Based Instruction

ABSTRACT

This document contains the papers on distance education from the SITE (Society for Information Technology & Teacher Education) 2001 conference. Topics covered include: the distance education degree program for the Master of Mathematics with a teaching option at Texas A&M University; the evolution of online learning; Internet-based distance education; teaching and learning online--lessons learned; a hybrid online course to enhance technology competencies of school principals; exploiting and evaluating a World Wide Web-based learning system; using constructionist principles in designing and integrating online collaborative interactions; learning styles and potential relations to distance education; using electronic portfolios to support accountability and preservice teacher preparation; the future of distance education; the challenges of interfacing between face-to-face and online instruction; establishing a new paradigm for online education; cost effectiveness and distance education; Web-based versus print-based faculty development; assessing best practices in online learning; a examination of perceived effectiveness and student satisfaction in distance learning in higher education; online personal learning in teacher preparation; developing standards of quality for online courses; online conversation in a teacher education seminar; how information technology can help education and distance learning; matching distance education with cognitive styles in various levels of higher education; the need for a paradigm shift in order to effectively teach Web-based instruction; designing, administering, and teaching distance education; benefits and problems of asynchronous online electronic mail forums; the distance teacher; videoconferencing in a practicum of educational studies; desktop video conferencing; designing distance education support; the Russian experience with an academic staff development course for coordinators of distance education; effective strategies for the information highway; a compromise for the creation of computer-supported collaborative learning applications; supporting and evaluating distance learning students' use of an electronic discussion board; developing an online course about online courses; reflections of K-12 teachers on graduate education via distance learning; instruction using WebCT; real concerns on distance education when distances are real; and whether distance education resolves the current problems of education. Most papers contain references. (MES)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 457 822

DISTANCE EDUCATION

Section Editors:
Frank Fuller, *Northwestern State University of Louisiana*
Ron McBride, *Northwestern State University of Louisiana*

The Internet and asynchronous delivery continue to dominate distance education presentations this year. As web-based learning becomes more commonplace, scholars are turning from writing about discovering the medium to investigating the underlying issues related to designing and evaluating distance education. Instructional design and program development papers occupy prominent roles in the Distance Education section, and the descriptions of exemplary programs include extended discussions of the implications for development across the discipline. Several presentations center on broad management, technical, or cost-effectiveness issues of distance delivery, overall. Video and other delivery media than the web have a place in this year's collection, with studio and desktop video the most regularly occurring.

How distance delivery affects instructional design continues to be the central question in distance education, and that centrality is reflected in the number of papers in this section. Nada Dabbagh addresses the issues that arise in The Challenges of Interfacing Between Face-To-Face and Online Instruction," while Michael Kadlubowski probes the impact of design on faculty in "Is A Paradigm Shift Required In Order to Effectively Teach Web Based Instruction?" Kasprzak and Nixon raise – and significantly answer – the troubling issue of "'Cheating' in Distance Education. Broader considerations comprise the "Kaleidoscope of Designing, Administrating and Teaching Distance Education" in a panel led by Shelia Kieran-Greenbush, Victor Alusine, Pamela Furline, and Elsie Szecsy. "Kaleidoscope" implies many views and many choices, and that variety is explored by Karen Lemoine, who examines the role of "The distance teacher: the ultimate distance learner."

The faculty member's role in distance programming is also the subject of "One size does not fit all: designing distance education Support" by Euncie Merideth and Peggy Steinbronn; while Kevin Oliver and John Moore describe faculty development in the process of "Transitioning from online teaching to online learning." "Web-based instruction: what should we know?" explores the full scope of technical and design skills necessary, in a paper by John Ouyang and James Yao. Technical tools form the center of the discussion of the vital subject of providing education to persons with disabilities, in "Access for all: developing an online course about online courses" by Loye Romereim-Holmes and Denise Peterson.

Equity in distance education extends beyond overcoming handicapping conditions, of course, and Luiz Senna introduces the changing equity picture in "Autonomy and knowledge—comments on distance education design," while Osama Shata and Mohamoud Abaza, in "Distance education: an ultimate subject for teachers and students," and Ya-Ting Yang and Timothy Newby ask "Does distance education resolve the current problems of education?"

Three papers investigate the relationship of learning theory to distance education. In "Using constructionist principals in designing and integrating online collaborative interactions," Blocker and Tucker make a case for a necessary relationship between constructivism and distance education. In "Learning styles and potential relations to distance education" Buboltz, Wilkinson, Thomas, and Jenkins present theory and strategies for meeting the needs of different kinds of learners, as do Jenkins, Buboltz, Wilkinson, and Beatty in "Matching distance education with cognitive styles in various levels of higher education."

Theory and design alone do not characterize distance education, of course. There still is a place for explorations of computer programs and delivery platforms. Five papers present a broad spectrum of technical variety within the general framework of asynchronous delivery. In "The road ahead: the evolution of online learning," Alicia Balsera explores the changes that technology will permit, and require, in the near future, while Hossein Jahankhani presents a cross-discipline review in "How information technology can help education, distance learning."

IR 020 892

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

G H Marks

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

BEST COPY AVAILABLE

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
● Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Some familiar specific technology solutions have a new life in three papers. "Simple is good: course content, electronic mail and the benefits of asynchronous online forums" is Kevin Lee's exploration of text-based tools in student interaction and reaction. The electronic discussion board within otherwise traditional classes is explored by Richard Pountney and Alice Oxholm in "Supporting and evaluating distance learning students' use of an electronic discussion board"; while Web-CT as a delivery platform forms the way Ingrid Thompson-Sellers moved delivery "From "inches to miles": Web-based instruction using WebCT (V 3.1)."

Though many presentations focus either on post-secondary or general issues, training and staff development continues to grow in its importance within distance education. In "A hybrid online course to enhance technology competencies of school principals," Sally Beisser and Peggy Steinbronn describe an approach to the important task of providing graduate education to working school principals. Electronic media sometimes replace printed material, of course, and "A comparative project: web-based faculty development versus print-based faculty development" describes Melissa Diers's analysis of the effectiveness of both forms of delivery. Chris Koble compares distance to face-to-face development in "Action research results: on-line vs. traditional face to face professional development." As distance education closes distances, problems and their solutions continue to be broadly interesting without losing a local flavor, and Marina Moisseeva and Victor Krivoshokov provide a particularly interesting example. "Academic stuff development course for coordinators of distance education: Russian experience" details a national project addressing needs that are perceived world wide.

No form of professional development is more important to SITE readers, overall, than teacher education. The pioneering role of distance education in preservice teacher education programs has only grown, as have the burgeoning needs for electronic portfolios, field experience, and alternative certification. Gerald Burgess and Barbara Holmes describe how to use "Electronic portfolios to support accountability and preservice teacher preparation" in their poster session, while David Gibson focuses on "Online personal learning in teacher preparation." Personal growth and exploration is the focus of Helflich and Putney, in "Reflections of reality: online conversation in a teacher education seminar" and of Stinson and Stanbrough's "Reflections of K-12 teachers on graduate education via distance learning." Discipline-specific preparation, on the other hand is the focus of Allen and Pilant's "The distance education degree program for the master of mathematics with a teaching option at Texas A&M University."

Instructional programs aren't limited to teacher preparation, of course, and four papers present lessons learned from elaborate and innovative projects. Baumbach, Bird, and Eastman present "Teaching & learning online: lessons learned" describes the experiences of a technology resource center, and Krin Bryson presents a poster session on the "SETTEN distance learning project." A national support system is described by Salvador, Santos, and Lima in "UGF Virtual Campus: integrating information, communication and cooperation in the web," while Jean Kueker and Jerrie Jackson ask, simply, "Are we there yet?"

Management and budgeting are never far from consideration by the technology educator, so three papers review issues that concern us all. Dickey and Dickey describe a model for calculating "Cost effectiveness and distance education: a perspective decision," as does Michalski, in "Cost effective electronic course development and delivery via the Internet." Judith Smith, more ominously, describes "Managing the dark side of online courses — while enlightening your online students."

The management considerations across borders and among institutions are the focus of "A survey of internet based distance education" in the United Arab Emirates, by Emad Bataineh, and of the Canadian perspective on "Real concerns on distance education when distances are real" by Leo Wells.

Not all distance education is delivered through the Internet, of course, and video applications continue to grow in popularity as they cost less. Even "Interactive television: the good, the bad, the ugly" interest Allen, Gustafson, Holt, Kysilka, and Dickey. The international implication of "Videoconferencing in practikum of educational studies" is the focus of Jukka Maki's description of a program in Finland, while "The use of two-way audio video at the University of North Texas as a tool for practicum supervision" is a description of a vital link in field experience, presented by Pemberton, Tyler-Wood, Cereijo, Rademacher, and Mortensen.

McBride, Fuller, and Gillan describe the details of Desktop video conferencing: the optimum solution for synchronous distance learning", and Pierrou and Musset present "The use of videoconference in the learning and teaching process: emergence of new mediations?" Then, Zimmerman and Greene detail "Effective strategies for the information highway."

Practice, of course, rides on research. Five papers describe the considerations both practitioners and researchers must make when designing effective models of enquiry for distance education, either for assessing programs or creating knowledge. "Assessing best practices in online learning: A review of the literature" summarizes many of these studies, compiled by Dwyer, Sunal, Giesen, Sunal, and Trundle. Participant opinion in one program is gauged in "Distance learning: Perceived effectiveness and student satisfaction in higher education" by Donna Gabrielle. And

Hartley, Gibney, Heflich, and Strudler describe "Developing standards of quality for educational technology distance education courses." Assessing multiple roles forms the center of "Teacher and developer: compromise for the creation of CSCL applications" by Osuna, Dimitriadis, Martinez and Anguita, while Burcu Tunca predicts "Distance education and what is coming next."

Every reader is touched, in some way, by distance education; none of us is immune to its effects, and few can help feel excited by its implications. The authors of these papers share that interest and excitement. From international programs to innovative research strategies, there is some thing in this section to intrigue, inform, and challenge every reader.

Frank Fuller, PhD, is Assistant Professor of Adult and Continuing Education, and Ron McBride, PhD, is Associate Professor of Educational Technology at Northwestern State University in Natchitoches, LA.
Fuller: fullerf@nsula.edu; 318/357-5862
McBride: mcbride@nsula.edu; 318/357-5522

The Distance Education Degree Program for
The Master of Mathematics with a Teaching Option
At Texas A&M University

G. Donald Allen
Department of Mathematics
Texas A&M University
College Station, TX 77843-3368
USA
dallen@math.tamu.edu,

Michael S. Pilant
Department of Mathematics
Texas A&M University
College Station, TX 77843-3368
USA
mpilant@math.tamu.edu

Abstract: This paper is a report on the planning, development, and implementation of the online Masters degree program offered by the Mathematics Department at Texas A&M University. The degree, which is completely online, is targeted primarily to secondary high school teachers that desire to sharpen their mathematical skills or advance their overall learning, particularly to qualify for teaching positions in community colleges. The issues, far exceeding those of a new program in the traditional form, range from recruitment of students to negotiating intellectual property contracts.

Introduction

In the spring of 1999, the Provost of Texas A&M issued a Request for Proposals to develop online graduate programs. With funds up to $150K available, the RFP attracted many proposals. Fortunately the authors had already established a record of accomplishment of producing Web assisted and Web-based materials. (Allen 1998, Pilant et al. 2000). The next step towards establishing a Web-based degree program was not a large one. There were details, primarily logistic in nature, regarding timetables and deliverables.

In this paper we consider a number of the most important aspects of putting together such a program, making it as generic as possible, so that it may apply to areas other than mathematics. The process is new to most institutions, and the issues are far-reaching. In this paper, we will discuss:

1. Creating the program
2. Designing online courses (two examples)
3. Intellectual Property
4. Publicizing the program
5. The students.

Creating the Program

Making a case for a graduate program to serve schoolteachers is not difficult. The facts of the current educational state of the country make the case for us. The first few lines of our proposal read as follows:

> *With current State of Texas mandates to offer more AP level courses, the educational needs and demands on the high school teaching faculty of State high schools are greater than ever before. These and state requirements for CEU's (Continuing Education Units) give a ready market of potential students for a distance master's level program in mathematics education that in numbers alone exceeds almost every other potential distance masters program. That this program already exists in traditional format and has graduated many students serves to establish that it already enjoys a credible market.*

The need, as we argued, was certain. However, was the desire actually there? That remained to be determined. Programmatically, our department already operates a Masters of Mathematics with a Teaching Option, which has been fully approved by the State of Texas Coordinating Board of Higher Education. Therefore, the implementation of the online program did not require the massive procedural measures of that process.

To complete the program, that is, to obtain a master's degree, the student must complete the **same requirements** as the on-campus student. Students must take 36 hours of courses, of which at least 24 hours must be mathematics courses. Enrichment courses in statistics and education or educational psychology are required, as well. There is no diminution of the course requirements. At present, students must appear on campus to take a one - three-hour comprehensive oral examination to satisfy the degree requirements.

Designing Online Courses

The issues are becoming well known: Before constructing an online course, a Web assisted course, or a Web-based course, it is important to consider the many choices available to accomplish the project (Pilant et al. 2000). We collect a few of the choices of greatest urgency, focusing on the various styles and features that can be brought to such a project. We will also consider some of the logistic details of Web course creation, deployment, and use. Just to mention a few:

- What are the merits of Java Applets?
- How much does it cost to produce a course?
- Can online course be cost effective?
- What about video-streaming?
- What are the basic tools?
- How can we provide help online? Is there really a way to do it?
- What types of skills does the faculty member need?
- How much time does it take?

Full or partial content or textbook-based courses are current choices. The value-added features can make the difference between a mere sequence of Web pages and a truly online course. What sorts of features you add will make the course a success or failure. Content should be relevant. It should be easy to navigate, and your design should be intuitive. The online course should consist of several features: content, links and resources, quizzes, homework problems, navigational devises, and a table of contents. If your course is full content, you must of course write the equivalent of a textbook, a time consuming task, as one knows. Still, writing such a course is sufficiently different from writing a print text that considerable time must go into its creation. This is not the place to describe these features; so, it is best for the author to find examples of online courses and note their differences from a full print text.

If the course is to be primarily text based, then the value of the course is equal to the portion that is value-added to the textbook. For example, if all that is added is the syllabus portion, with assignments, this is little more than a self-study course. However, it is well known that such courses have limited efficacy for most students and none at all for some. Therefore, it is important to include a variety of materials that will aid the student in comprehending the text. This can include further or fuller explanations of important issues. It can include links to and discussion about resource links; it can also include particular goals of selected readings or text chapters. The student should feel that the online course is an essential part of the course, without which comprehension would be difficult to achieve. In addition, your portion of the course should include content, which the student must learn to be successful on exams. The partial content course should not conflict with the primary text. If it contains supplementary examples or chapters, this is ideal. It could also present alternative viewpoints for comparison. However, it should avoid dual sources of course materials. In most cases, the student will select one of the sources over the other as the primary authority.

There are more issues. For example - assessment (Hall et. al. 1999), streaming media, JavaScript, Java, testing instruments, bulletin boards, chat rooms, development tools, homepage, and course management systems (Allen 2001). Each of these requires an equivalent chapter of discussion. However, in this note we limit the discussion to two particular courses.

Math 629 – History of Mathematics.

This course is full content based. The course page is primarily a collection of goals, readings, and problem sets. In appearance, it looks much like a book online. Most of the readings are PDF Acrobat files that can be printed by the student. It should be noted that one of the major issues still facing the technical sciences is how to adequately display mathematics on the Web. There are many ways to do it poorly, but the ultimate way embodied in MathML (a markup language akin to HTML) has yet to be implemented by the major browsers (Allen, 2000b). A popular alternative to MathML is Adobe's Portable Document Format, PDF. It makes the document look exactly the way it was typeset. However, inserting interactivity, or almost anything else is either time consuming or difficult.

In addition, there are a large number of links to readings at other Web sites. The reason is two-fold: First, there is a wealth of material about the history of mathematics on the Web, and much of it is first rate. Students should learn to explore the Web and use it to their advantage. The second reason, is that it is almost impossible to write in a single document all that should be available to the students.

Math 696 – Mathematics Communication and Technology.

This course is based on the idea of directed tracks, a set of which will be selected by each student enrolled. With each track, specific milestones of accomplishment will be attached. The course will be complete with a capstone project that will bring the various tracks together in a large project. Below we list some of the envisioned tracks.

1. Mathematical document preparation
2. Computer algebra systems (e.g. Maple, Mathematica)
3. Web page development (incl. math-to-web conversion)
4. Programming (Java, C++, asp)
5. JavaScript
6. Test preparation/Online testing
7. Using graphing calculators
8. Graphics design for Web pages

As is apparent, the skills of the instructor should be broad based for this course format. Indeed, at this time, no faculty member in our department would feel comfortable directing students in all the possible tracks. Yet, people are continually emerging with new skills. We are excited about this course, particularly its nature that seems very much in concordance with the paradigms of the Web. More information about this program can be found at http://distance-ed.math.tamu.edu/index.html

Intellectual Property

With two authors producing content under the terms of the proposal, with the University contributing funds toward the production, and with the assumption that the materials generated have market value, the natural question to ask is: ***Who owns the material?*** Concomitant with that question is another one of equal importance: ***How should the distribution of royalties or income from these materials be made?*** Both of these complex questions required ongoing discussions with university lawyers and licensing officials for more than a year before an accord was reached. Before outlining what contractual terms we regard as fair, it worthwhile to mention and discuss other questions that may be even more complex.

1. If Professor X writes online content for Math YYY partially using institutional resources, does the institution have the right to revise those materials at some future point? (Naturally, the "shelf" life of one of these early efforts of online courses is brief – perhaps two years. To keep the course viable, it will need to be updated or upgraded. Who controls that process? What remedy is accorded the institution if Professor X declines the task?

2. What if an author permanently leaves the institution? Does the author have the right to load the course on a server at a new institution? Can he subsequently revise it there and offer it in competition with the version running at the original institution?

3. Should students at the home institution pay to use the materials?

The answers to these questions hinge critically upon the definition of the term "substantial resources." For example, if the faculty or staff member is assigned the task of creating an online course and that becomes part of the job requirements, the "work-for-hire" model may apply. In this case, the university owns what is created, and may at its discretion distribute future income to the creator. When the compensation is more than just an office computer and secretarial help but less than the full salary, the question becomes this: Does the contribution of the institution measure up in a tangible way as a substantial contribution to the production of the online course? Some institution will argue in even this case that ownership resides with them because an employee created the product. We regard this view, which makes sense in industry, to be stifling to the creativity of their faculty. Such a narrow and constrictive (even greedy) policy may well result in diminished quality or quantity of production that over the long run may be more costly, when that same institution, in order to operate their Web-based and distance education programs, will have to license products generated elsewhere.

Since the creation of one of these courses requires time far in excess of writing the equivalent amount of material for a textbook, and since only a handful of faculty have anything near the skills to produce such an effort, it would seem prudent for the institution to be as generous as it can and to nurture this talent for maximum creativity. Faculty members treated fairly work tirelessly in such an environment.

At the opposite end of the work-for-hire model is the professor that produces a Web-based course solely on his/her own initiative. In this case, the university does not contribute any meaningful resources toward the effort. In this case, the creator of the materials should have 100% IP ownership and should be accorded 100% of income distributions. Moreover, the university may not revise the materials without consent of the author. Succinctly, the traditional textbook model applies.

Somewhere in the middle is where the real difficulties reside. Most institutions will regard any amount exceeding $20K, or several course releases, as substantial. Admittedly, they have a case. Nonetheless, authors should be granted 100% IP ownership. If the author owns it, the product will undoubtedly be better. However, the distribution of income can be negotiated. With regard to our particular program, the university agreed to just these terms and to giving the authors a majority of future royalty income. As is the custom here at Texas A&M, authors do not benefit financially from students at their own institution using their books or online materials. That means course fees are either not assessed or are returned to the university.

Texas A&M University has recently proposed a meditated technology instruction policy with terms similar to these at its cornerstone. The basic belief is that an open and fair policy will foster participation by qualified and competent faculty to produce the highest quality online materials.

Publicizing the Program

Advertising our program was an aspect that we did not originally anticipate nor fully understand. Normally, it is a process transparent to the faculty members' duties. Colleges are established institutions that attract students in traditional ways. For online programs, the rules change. We have prepared brochures, we have given numerous talks at teacher conferences and conventions, and we have engaged in direct mail advertising and we collect mailing lists. Below is one part of some advertising material.

The Masters of mathematics with a teaching option taken online has four tremendous advantages:

- **You can take courses at your convenience.**
  There is no residency requirement.
- **Partial courses, called *certificates*, are available.**
- **Special courses, such a Maple, Java, and Web design will be available – with a mathematical emphasis.**
- **Courses are transferable.**

In this brochure, we review the procedures for getting started.

Prospective students don't have a historical perspective of these programs or what they are about. We must educate the students to what the program is like, how courses operate, what is expected, and even how to enroll. They want to know. At the recent CAMT[1] meeting in Houston, we presented our new program to an overfilled room of more than one hundred teachers. The interest is genuinely profound. Many teachers said how appreciative they are that such programs are becoming available.

Because of these efforts, we receive inquiries about this program on a daily basis. The questions are similar. All want to know what, how, and sometimes how much. Typical questions follow. "Are there scholarships?" "I haven't been in college for twenty years. How will I do in math courses now?" "What courses are offered now?" What about the summer?" "I just finished a degree in computer science, but I want to teach math. Will this program enable that?" It is gratifying for professors at a large university such as Texas A&M to see impact of their work so quickly, and with such enthusiasm.

The Students

The demographics of teachers that have enrolled in the program range far beyond what we expected. Excepting a few regularly enrolled graduate students, all teach mathematics at some public institution. We anticipated the bulk of our teacher/students would be high school teachers. However, they span a wide range from elementary school teachers to community college instructors. Their reasons for taking the course are as many as their number. None of them have indicated that their direct goal is to get a master's degree at Texas A&M University. A couple of them desire better positions in their own schools, and taking these courses as CEU's will help them. One requires 18 graduate hours in mathematics to qualify to teach in a community college, a SACS requirement. Another is enrolled in a masters program at another institution and is taking online courses from us to transfer. Yet another has been teaching 25 years and just wants to take a mathematics course.

All the students have full and complete lives – job – family – children – community involvement, etc, and many of them are taking several courses simultaneously. Indeed, two are teaching full time and taking three graduate courses! Both have expressed some regret about that. We have tried hard to be flexible about assignment dates, realizing that these students are fully mature individuals and do not merely shirk their scholastic duties. It is important to accept these facts about this new educational landscape, and to remember that the educational service we are providing is crucial to many, many people. Strict construction of assignment dates seems somehow inappropriate.

We suspected that the mathematical strength of our new distance students would not be up to full time regularly enrolled students. What was the case was that they were mathematically weaker than we hoped. This has required some adjustment in the types of assignments given. For example, in the History of Mathematical course, mathematical problems are typically assigned to be solved with period techniques. These problems are not difficult but do require advanced problem-solving skills. Many teachers in the field for several years or those that focus on educating the very young have seen those skills erode over time.

---

[1] Conference for the Advancement of Mathematics Teaching. This is the major annual conference for schoolteachers of mathematics in Texas. It normally attracts about 8,000 attendees. Teachers come for many reasons: to gain CEU's, to learn about new programs, to present results of their classroom activities, and more.

Therefore, to compensate for this, optional assignments of essays were given wherein the teacher could relate the period methods or problems to teaching and pedagogical issues. For example, one essay given to all students was to analyze the use of pictures in (mathematical) proofs. This essay question, which was based on a current paper in the Notices of the American Mathematical Society, allows the student to bring in a wide array of historical resources and then to relate it to their personal teaching philosophy. Other questions of this nature have been created to challenge all students, whether pursuing a Ph.D. here or whether just learning some more mathematics.

Conclusions

Creating an online degree program today has very much the same comprehensive, all encompassing nature of forming a new business. There is little one can simply plug-in to existing infrastructure. The delivery is different; the assessment is different; the student demographics are different; recruitment, retention, and motivation of students are also different. The desire for learning is intense. However, the need for temperance of course administration is essential. As well, an acute understanding of student backgrounds in contrast to regular on-campus students is paramount.

Finally, as must always be mentioned in a forum such as this, we are in a transition period. In just a decade, perhaps less, online education, online degree programs, and the like will be institutionalized. Students will have clear expectations, and faculty will again have established ground rules. Course administration will be established in comfortable grooves. Methods universities use to compete for and recruit students will be once again transparent to faculty, and developers such as these authors will spend all of their time developing online courses, new techniques, and learning new skills for the next generation of interactivity.

References

Allen, G. D., M. Stecher, M. S. & Yasskin, P. (1998). The Web-Based Mathematics Course, a survey of the required features for an on-line math course and experiences in teaching one, *Syllabus Magazine*.

Allen, G. Donald, (2000a). Online Calculus - The Course and Survey Results, to appear in *Computers in the Schools*, in press.

Allen, G. Donald, (2000b). What Do We Do Until MathML?, in the *Math/Science Online Newsletter*, Fall 2000. Available: http://www.math.tamu.edu/ms-online.

Allen, G. Donald (2001). Online Choices, to appear in the *Proceedings of the Thirteenth Annual ICTCM Conference – Atlanta, GA, Nov 16-19,2000*, Addison-Wesley-Longman.

Hall, R., Pilant, M, Strader, R. (1999), The Impact of Web-Based Instruction on Performance in an Applied Statistics Course, (pp. 261-266), *Proceedings of International Conference on Mathematics/Science Education and Technology*

Pilant, M., Hall, R., Epstein, J., Hester, Y., & Strader, R., (2000), Issues Involved in a Large Scale Implementation of Web-Based Mathematics Instruction, (pp. 334-339), *Proceedings of International Conference on Mathematics/Science Education and Technology*

The Road Ahead: The Evolution of Online Learning

Alicia F. Balsera
Academic Computing
University of South Florida
United States
alicia@usf.edu

Abstract: This paper will focus on the structural and interfacing mechanics of the software that will facilitate support efforts and minimize the frustrations encountered by new users whether they are students, faculty, or course creators. The course shell creation process, student enrollment, passwords, faculty loading, role definitions, reusability, reliability, scalability, all provide potential challenges--even for the best pedagogical designs. The goal is to define a comfortable environment for technology application to classes so that online instructional tools may be assumed as much a part of the academic environment as classrooms and chalkboards.

Introduction

Institutions with mission-critical needs for their online teaching and learning environments require a comfortable environment and a sophisticated technology base for their large-scale systems. Considerable attention has been paid to estimating the effectiveness and general pedagogical value of classes using web-based courseware as the delivery mechanism. Aside from the learning dynamics themselves, there are features of the courseware that can lead to adoption- and support-related challenges. These features are often inherent and not under the control of course creators. Unfriendly access procedures can create enormous frustrations for novices. The resultant loads on faculty can lead to disenchantment at the least.

The course shell creation process, student enrollment, passwords, faculty loading, role definitions, reusability, reliability, scalability, all provide potential problems --even for the best pedagogical designs. The goal is to define a comfortable environment for technology application to classes so that online instructional tools may be assumed as much a part of the academic environment as classrooms and chalkboards.

This paper will focus on the structural and interfacing mechanics of the software that will facilitate support efforts and minimize the frustrations encountered by new users whether they are students, faculty, or course creators.

Thesis

Online education can be defined as an approach to teaching and learning that utilizes networked technologies to communicate and collaborate in an educational context. This includes technology that supplements traditional classroom training with web-based components and learning environments where the educational process is experienced online.

The application of computing to the teaching/learning process often follows a sequence of this kind:

- Adoption of a small number of tools (either for presentation preparation or specific tools for the disciplines)
- E-mail as an aid to communication
- Electronic threaded forums
- Instructional modules and class materials

These "islands of applications" often lead to a fragmented environment requiring multiple authentications (i.e., logins), with system administrators adopting a cottage-industry approach to class management issues such as class rolls and grading. Integration to the Student Information System seldom exists.

Nearly all of higher education institutions currently engage in some type of online learning. Academic and professional organizations agree that using web-based learning environments can offer sound pedagogical benefits. Researchers from Cornell University estimate that "the web provides significant new functionality in transmitting information to the student and providing forums for exchange. The web is revolutionizing some areas of study through increased opportunities for learning and alternative formats for information" (Dwyer, Barbieri, & Doerr, 1995). The American Distance Education Consortium has derived a set of *Guiding Principles for Distance Teaching and Learning* based on the assumption that "principles that lend themselves to quality face-to-face learning environments are often similar to those found in web-based learning environments" (ADEC, 1999).

The web's facility for synchronous and asynchronous interaction provides the medium of choice for online learning offering educational advantages such as:

- 24x7 accessibility to course materials
- Student-centered teaching approaches
- Enhanced student-to-student and faculty-to-student communication
- Just-in-time methods to assess and evaluate student progress
- Reduced administration overhead via course management tools

Again, there are the issues of the islands of applications.

Online Class Concerns

In an effort to streamline the online educational delivery systems and create more of a "one-stop shop" for teaching, learning, and doing business with the university, USF began to investigate methods for improving its on-campus course offerings in 1994. Tasked with finding a software platform that would be valuable for students and instructors, administrators, as well as IT staff, we began by compiling faculty-defined requirements for class delivery. The checklists of critical issues considered are provided below. The first deals with the functions delivered by the courseware, the second with issues critical to the successful deployment and operation of the instructional environment provided by the courseware.

Desired Functions

- Single point of entry, one integrated application for users
- Web interface (no client required)
- Easily used by students, minimal learning curve
- Ability to include text, graphics, video, audio; minimal use of HTML if at all (but available if desired)
- Threaded discussions
- Full text search
- Support character sets for other languages, and for mathematical symbols
- One-to-many, many-to-one, many-to-many communications, public and private, asynchronous and synchronous
- Record students viewing material (attendance record and timing)
- Online testing of various kinds with provision for feedback if desired; test record/grade book

Academic Issues

- Carry-overs for incompletes
- Semester-to-semester course migration
  - Same course number, different instructor, different content
  - Serially in time or at the same time
- Completely distant learners (no access to campus) vs. campus visiting learners
- Student Internet skills

Support Issues

- Security
  - Student privacy
  - Intellectual property
  - Assessment integrity
- Ability to easily and automatically import class lists and associated information from external sources
- Ability to easily and automatically create course sites for many classes (i.e. templates); batch registration tools
- Ability to easily and automatically transport material easily between courses
- A global view, calendar, task scheduler, etc. for students in multiple classes
- An organizational chart (equivalent to a site map) for the class
- E-mail/chat/discussion groups created automatically for the class, with the ability to be reorganized by the instructor
- Web-based vs. application-specific e-mail
- Industry standard database interface vs. proprietary database
- Server requirements, storage estimates
- Scalability
- Extensibility via open API's

Online Educational Delivery Systems

In August of 1998, three course management systems were selected for evaluation based on the measures defined previously:

- TopClass - WBT Systems
- Web Course in a Box - MadDuck Technologies
- WebCT - WebCT, Inc.

The comparison criteria used in the assessment took into account the roles of the learner (consistent navigational interface, student tools, etc.), the instructor (access to grade book, course/lesson tools, etc.), as well as, the administrator (batch mechanisms, help desk tools, etc.). A significant number of instructors used the delivery systems as an adjunct to classes and provided feedback with respect to the breadth and depth of the features of each courseware for a period of one year.

Although these multimedia courseware-authoring systems facilitate the creation of more flexible and customized educational environments, no single product by itself contained all the desired features. In addition to the applications concerns, areas connected with technical support issues, scalability and reliability were also explored.

In January of 1999, Blackboard's CourseInfo was added to the evaluation pool, and by August of 1999, two of the applications were identified as desirable vehicles for the delivery of online courses warranting further appraisal:

- CourseInfo - Blackboard Inc.
- WebCT - WebCT, Inc.

Enterprise Electronic Aid to Instruction

The University of South Florida wished to deploy a portal with implementation of single sign-on access to a full range of applications and information (represented below in Figure 1). In the first phase USF's efforts were to focus tightly on courseware delivery. The tasks associated with this phase would involve mapping more than 36000 students and their instructors into 3000 classes each semester. This courseware development was tempered by our concern to ensure that the authorization process and other related procedures would also facilitate the development of the portal as a vehicle for delivery of other services to the entire USF community.

With the intent of unifying USF's diverse online campus systems into one fully integrated platform that incorporated the university's administrative systems, such as registration and grades, with a course management system to deploy Web-based courses, the task at hand was finding a software platform that would be valuable for students and instructors, administrators, as well as IT staff, and that could satisfy the following requirements:

- The platform must revolve around teaching and learning, with a robust course management system as its backbone
- The platform must offer opportunities to create a *community* of teachers and learners
- The platform must integrate with pre-existing administrative systems, specifically SCT® Banner™, to create a complete online environment

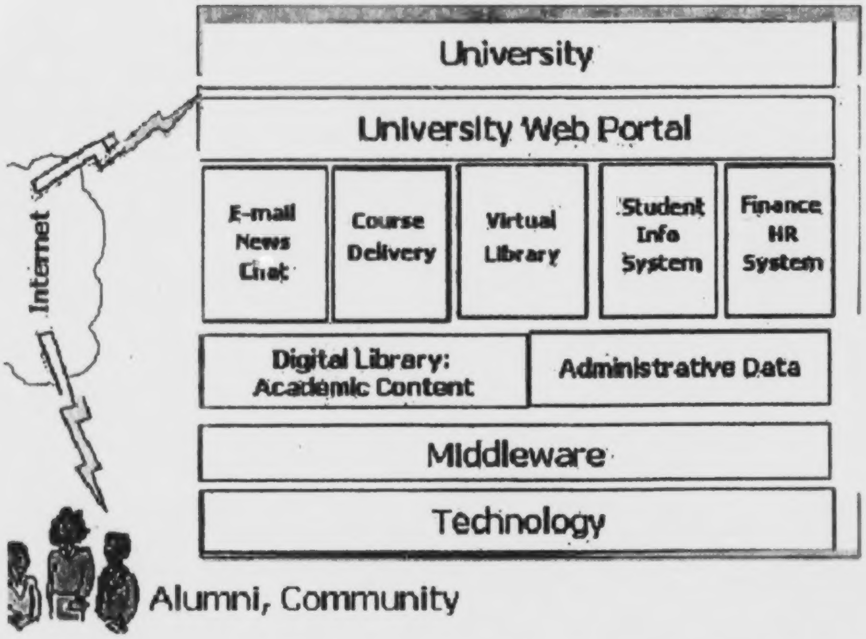

University
University Web Portal
E-mail News Chat
Course Delivery
Virtual Library
Student Info System
Finance HR System
Digital Library: Academic Content
Administrative Data
Middleware
Technology
Internet
Alumni, Community

Figure 1: Single sign-on campus portal providing access to a broad array of services and data

In September of 2000, Blackboard, Inc. and USF signed an agreement to integrate the Blackboard 5 Level Three advanced course and portal manager platform with the institutional back-office systems. In addition

BEST COPY AVAILABLE

to Blackboard' s course management technology and new portal capabilities, Level Three includes system integration tools that combine data from the existing Student Information System, Financial Aid Office, and other data-rich environments.

The levels of customization, flexibility, and scalability in Blackboard allow instructors to concentrate on providing high-quality content while administrators concentrate on managing the platform itself. The portal capabilities allow for the development of an online campus, giving distance learners and commuter students the ability to participate in on-campus life without needing to be physically present, minimizing the distinctions between distance learners and on-campus learners.

As a considerable number of faculty members use the courseware live in the classroom, as an adjunct to classes, even a brief loss of service is extremely serious. There is also almost no time available for loss of service for system maintenance, as the concept of the academic year becomes invalid in terms of extended online delivery of instructional materials. Thus, to provide the capabilities instructors need to leverage technology within the traditional classroom, these challenges inherent in bringing a campus online must be addressed. Disparate academic computing resources must be unified and integrated with existing back-office systems, and bombproof support services must be facilitated.

The integration concept involves process design, integrative software, effective training and support, and technological tools:

- Automatic assignment of an e-mail ID and computer account for every student
- Automatic creation of a set of electronic tools available for every course (listserv, chat, etc.) --to be used optionally at the faculty member's discretion
- Student name and address information captured once, and automatically made available wherever needed
- Cumulative student portfolio
- A single portal for students to access information for all courses, to financial aid information, to book purchases, etc.

This institution-wide portal is to provide single-login user authentication, as well as capabilities that allow each school, department or campus within the university to maintain its own customized environment. Some of the core features and functionality of this system are:

- Personal information management tools
- Powerful course management tools that enable instructors to provide their students with course materials
- Course communication and collaboration tools, such as discussion boards and virtual chat rooms
- Online assessment tools
- Dedicated academic resource center on the Web
- Web-based e-mail, calendar, announcements, and tasks scheduler
- Community management
- Institutional services management
- Institution-wide content sharing and management
- Course e-commerce management
- Customizable portal modules and information services
- Extended customization for institutional branding
- System administration management tools
- Enterprise-level database user management tools
    - API for user information batch extracts
    - API for event-driven (real-time) user updates
- End user authentication (security) API
    - Protection of intellectual property
    - Safeguard online enrollment and fees payment

These criteria enable the development of a mass-customization model for the development of an online teaching and learning environment that is both sustainable by our institution's infrastructure and flexible enough to adapt to the emerging technical environment. This approach comprises the linking of both existing corporate databases and purpose-built data stores linked to web pages that can be operated upon via standard web interfaces. Thus full extensibility and interoperability is provided for.

The intent is to concentrate on a functionality that can be accessed via a standard browser interface without the need for the installation by the user of client software. The Blackboard platform, while including text-based materials, online discussions and interactive quizzes, can also be used to extend the richness of the resource base for teaching and learning by increasing the use of a range of multimedia forms. It provides a simple and consistent user interface for all of the university's online offerings.

The USF Web Portal is to be implemented in stages. Underlying these is the strategic intent to:

- Establish first an online presence for every course in the university that affords student access via a standard browser to a simple and straightforward set of teaching and learning resources
- Use the experience of this minimalist online presence as a basis so that instructors can author materials via web forms, thus enabling them to focus on content rather than technical detail
- Integrate over time online other forms of student support and online administrative functions with teaching and learning resources
    - Access to a range of Library services
    - Access to online enrollment and fees payment

Ultimately, our goal is to service online all of a student's engagement with the university.

References

Dwyer, D., Barbieri, K., & Doerr, H. (1995). *Creating a Virtual Classroom for Interactive Education on the Web.* The Third International World Wide Web Conference, 1995.

ADEC (1999). *ADEC Guiding Principles for Distance Learning and Teaching.* American Distance Education Consortium, 1999.

A Summary Look at Internet Based Distance Education

Emad Bataineh, Ph.D.
Zayed University
College of Information Systems
Dubai, UAE
Emad.Bataineh@zu.ac.ae

Abstract: The Internet has truly and significantly changed the way we live, learn, work, and communicate. In today's digital information age, electronic services are constantly growing and becoming an integral part of our daily life. One of these popular electronic services is e-education through distance learning, and in particular Internet-based learning, which uses the Internet technology as a medium to deliver instructions as well as a communication tool to support interaction between faculty and learners. Distance education is originally designed as a self-paced alternative to traditional classroom instructions and becoming a major trend in higher education. Community colleges seem to be leading the way in the application of Internet based distance education technology by providing more educational opportunities to adult learners than those in four-year institutions, should four-year universities pursue this trend? especially small and private liberal arts colleges who are suffering financially as a result of low students enrollment, should they consider investing in electronic instruction delivery methods to expand their classroom-based academic programs.

Introduction

In today's digital information age, where e-education, e-business, e-commerce, e-government, e-communication, e-banking, e-entertainment, and other forms of electronic services are growing and becoming more and more closer to the mainstream, all of these services share one common technology and that is the Internet; which is used as a platform to deliver the above services. The Internet is a global network that consists of a large collection on interconnected computer networks around the world. The Internet contains a vast amount of information, estimates of several hundreds of thousands of terabytes (one terabyte almost equal to one trillion characters) that can be searched, retrieved, processed, and distributed electronically. The information found on the Internet exists in a multimedia form, and that is a combination of text, graphics, still images, sound, animation, and video. There are several services available on the Internet including electronic mail, world wide web (www), ftp, telnet, gopher, newsgroup and others. A synonym of the Internet is information superhighway, which emerged in early 90's; it provides a high-speed digital transmission system capable of providing connectivity to homes, schools, universities, businesses, and government offices (Kushwaha, & Whitescarver, 1994). It is capable of delivering and receiving multimedia information instantaneously.

The Internet has significantly changed the way we live, learn, work, and communicate. The Internet has revolutionized teaching and learning in many positive and effective ways. In addition, the Internet has a strong influence on distance education. Education has always been a challenge for many people to obtain, because it demands time, effort money, and high level of concentration and determination. But, sometimes people are faced with limitations that prevent them from pursuing their education; therefore, they start exploring other alternatives that can be the solution. Distance education is one of these alternatives, which offers educational opportunities at a time and place convenient for the learner. It also has increased people's access to the higher education.

"In the past, universities tended to own a local geography area, but there is no geography to it anymore. In the industrial age, we went to school. In the communication age, the school comes to us", DiPaolo said.

There is a growing number of faculty using the Internet to complement conventional classroom based courses (Pittinsky, & Chase, 2000). Current research has shown that one-third of all four public institutions and nearly 30 percent of all four-year private colleges and universities offer a complete degree programs through distance education (Wong, 1999). An estimated of 55 percent of four-year colleges and universities now offer online courses (Telg, & Irani, 2000). With increasing population of Internet users (80 millions in the US only), and the availability of personal computers at homes, with almost 50 percent of American households have a PC at home; this made it so convenient for people to acquire education through distance learning.

The common uses of the Internet in education include: research, communication, training, and curriculum as well as distance education. Internet based education is one way to implement the conceptual framework to use Internet technology in teaching and learning. In the past decades, there have been several medias and technologies used to deliver distance education such as regular mail, radio, television, facsimile, satellite broadcast, video tapes, telephone, teleconference, audioconference, videoconference, and recently the Internet. The three popular methods of distance education include one way prerecorded video-using satellite technology, two way interactive video and audio - using compressed technology, and Internet based technology (Pittinsky, & Chase, 2000). Internet based distance education is quickly becoming the predominant technology in distance education. This growth is attributed to the increasing power of personal computers, increasing telecommunication bandwidth capabilities (ISDN, ADSL), and powerful interactive communication and collaboration software and technology.

In this paper, my primary objective of this study is to provide a comprehensive understanding of several aspects, issues, and ideas related to the Internet based distance education and its technology. It will provide a look at the history, uses, technologies, challenges, effectiveness, advantages and disadvantages of the Internet based distance education as well as the characteristics of a typical distance education learner.

What is Internet Based distance learning

Internet based distance education is a form of distance learning in which the course content is delivered and the interactions are provided by the communication tools, technologies, and methodologies of the Internet (Jung, 2000). Internet based distance education has three major components: teacher and learners, separation by time and/or space (geographic distance), and communication mediated by Internet technology (Telg, & Irani, 2000). Through Internet based distance education learning occurs at the student's own pace, at a time and place convenient to the learner, with courses that meet his/her personal, educational, and professional goals (Weller, 2000).

The purpose of distance education (online classroom) is designed to reach a diverse population of learners and to provide open and convenient learning environments 24 hours and 7 days a week (Hara, & Kling, 1999). Distance education is designed as a self-paced alternative to traditional classroom instruction and becoming a major trend in higher education. It is suited best for self-motivated, self-directed, and self-disciplined individuals. Internet based education with the use of Internet based technology creates something called the virtual classroom or campus environment, where online it can provide learners the instructions, library resources, student learning assessment, course evaluation, student support services, and admission and courses registration. Through Internet based distance education, an individual can earn college credits, college non-degree credits, college degree (Bachelor, Master or Doctorate) or professional certificate as well as be able to participate in workshops, seminars, or training sessions.

Distance Education Learner Profile and Characteristics

Distance education is definitely not for everyone. A typical distance education learner usually belongs to one or more of these categories:

- Nontraditional learner
- Full time worker
- Parents
- People living in rural areas
- People with disabilities
- Females with children

In addition, each learner preferably should have the following key characteristics or skills in order to be a successful distance education learner:

- Good computer and Internet skills: basic computer, email, and www knowledge.
- Good time management skill: be able to complete tasks within the allocated time.
- Independent learning style: be able to work, study, and learn independently.
- Effective communication skill: be able and comfortable in writing.

Forms of Internet Based Distance Education

The five common Internet services used in distance education are electronic mail, file transfer protocol (ftp), world wide web (www), newsgroup, and chat lines. www is a hypertext based information service; it provides access to multimedia information in documents and databases. www is the most popular and fastest growing part of the Internet. E-mail is an electronic messaging communication system, which allows users to send and receive electronic data messages. Newsgroup is an electronic bulletin board that allows public discussion groups containing a set of articles about a single topic. File transfer protocol allows the transfer of data files and software between computers. Some or all of these Internet services might be incorporated into the Internet based course, depends on the pedagogical needs and instructional design used in the course (Telg, & Irani, 2000). Internet based education ranges from posting the course syllabus on the www to fully delivered, managed, evaluated, supported through the Internet. The four popular categories of web-based courses are:

• Web-presence courses:	Only very small portion of the course is presented on the web, such as a course syllabus.
• Web-enhanced courses:	Almost half of the course material is delivered through the web, including course syllabus, supplementary course material, assignments, projects, and additional resources.
• Web-centric courses:	The majority of the course material is delivered through the web. It integrates a significant use of web technology and services in the course, plus support for communication between the learners and the instructor.
• Web-based courses:	The entire course is taught, delivered, assessed, evaluated, managed as well as the communication between students and instructor occurs entirely through the web. Neither face-to-face interaction required between learners and instructor, nor physical attendance in a specific location is required.

The two popular forms of delivery of web-based courses are synchronous and asynchronous modes. The synchronous form requires real time communication and fixed time class meeting as in conventional classes where as the asynchronous form does not require the learner or the instructor to be in a fixed time or location and no real time communication. An example of successful models of distance education are British Open University (international model), Western Governors University (consortium model), California Virtual University (Virtual model).

Internet Based Distance Education Technologies

Currently, there are several Internet based technologies such as communication tools, services, and products that can be used by instructors to help them develop and maintain their online courses. An example of synchronous delivery is web based videoconferencing technology, which provides two visual connection and real time interaction and collaboration between instructor and learners. A synchronous learning environment requires a monitor or TV screen, web camera, microphone, and speakers. Some of the software tools available in the market to implement synchronous learning mode are NetMeeting and CU See Me tools and both provide Internet videophone system and real time communications.

Other type of commercial products and services used to implement Internet based courses are Blackboard, WebCT, Real education, and e-college. All of these services help colleges and universities to plan, design, create, manage, and maintain web based courses as well as creating virtual campus. Another option available for higher institution is to purchase programming development tools such as Java, HTML, and FrontPage or authoring software tools such as Macromedia Director, Macromedia Author ware, and Macromedia Dream weaver, and let the faculty develop their own courses. This option entitles higher education institutions to provide faculty with strong technical support and intensive training workshops to prepare faculty with basic and advanced skills and knowledge in technical, instructional design, and web based programming.

Distance Education Effectiveness

Here are some factors that help make distance learning more effective than traditional classroom instructions.

- When methods and technologies used are appropriate to the instructional design and learning activities.
- When there is student to student and instructor to student interaction through interactive communication tools such as e-mail, newsgroup, electronic bulletin board, and chat rooms.
- When there is fast and timely instructor to student feedback (exams, quizzes, assignments, and projects)
- The web-based courses should be interesting and appealing and should address a wide-range of learners with diverse learning styles and different needs and interests (Weller, 2000).

Many studies have indicated that students participating in distance learning courses perform as well as their counterparts in a traditional classroom (Phipps, & Merisotis, 1999). The student performance is measured using test scores and grades in the courses. Similar studies have also concluded that students and faculty have a positive views and attitudes toward distance learning (Phipps, & Merisotis, 1999). In the contrary, there are other studies have shown students' frustrations and dissatisfaction due to the following reasons/ factors (Hara, & Kling, 1999):

- Lack of prompt feedback
- Ambiguous instructions on the web
- Experience technical problems

Advantages and disadvantages of distance education

Most research studies emphasize the positive aspects of distance education.
Here are the advantages so far for distance education technology:

- Offers educational opportunities at a time and place convenient for the learner.
- Remove geographical boundaries between learners and the instructor (students in remote areas can take advantage of learning opportunities with traveling long distances)
- Increases access to higher education.
- Offers learners a wide rang of choices, topics, courses as well as degree programs to students.
- Cost effective, travel costs are saved, especially in times of high gas prices.
- Reduces the need to build and maintain college buildings and facilities.

But, disadvantages of distance education can also be summarized as follows:

- Start up costs to students and institutions are high, a learner will pick up the cost to purchase a computer with all necessary software to get connect to the Internet, in addition to monthly fees for an Internet service provider company. Institutions also need to provide the all required equipment and proper faculty training to use the technology effectively.
- Labor intensive, web-based courses usually take long hours to plan, design, develop, manage, and deliver.
- Most educational institutions still do not have adequate infrastructure to design and deliver web-based education.
- A lot of legal issues such as copyrights and intellectual property rights need to be clarified and explained.

Conclusions

In conclusion, Community colleges seem to be leading the way in the application of distance education technology in course delivery and assessment by providing more options to adult learners those four-year institutions. Should four-year state universities pursue this trend? Especially small and private liberal arts colleges who are suffering financially as a result of low student enrollment should consider investing in electronic instruction delivery methods to expand their classroom-based academic programs. The fact that the course contents and support services exist 24-7 online on the web, it does not mean by any way that the instructor will also be available and accessible online 24-7, this misunderstanding among learners sometimes lead to frustration and dissatisfaction

References

Hara, N. & Kling, R. (1999). *Student's Frustrations with a Web-Based Distance Education Course.* Peer-Reviewed Journal on The Internet.

Jung, I. (2000). *Internet-Based Distance Education.* . The Pennsylvania State University: The American Center for the Study of Distance Education. Available at http://www.ed.psu.edu/acsde/annibib/annbib.asp.

Kushwaha, R., & Whitescarver, J.(1994). *Integration of Virtual Classroom and Multimedia on the Information Superhighway.* ISMM International Conference on Distributed Multimedia Systems Applications, August 15-17, Hawaii.

Phipps, R. A. & Merisotis, J. P. (1999). *What's the Difference? A review of Contemporary Research on the Effectiveness of Distance Learning in Higher Education.* Washington, DC: American Federation of Teachers and National Education Association.

Pittinsky, M. & Chase, B. (2000). *Quality on the Line: Benchmarks For Success in Internet-Based Distance Education.* The Institute for Higher Education Policy. Washington, DC.

Telg, T. & Irani, T. (2000). *The Distance Education Handbook: A guide for university faculty.* University of Florida, Available at http://www.ifas.ufl.edu/~rtelg./handbook3a.html.

Weller, M. J. (2000). *A web based, Distance education course on computers and the Internet for entry level students.* Open University, U.K., Available at http://www.technology.open.ac.uk/tel/people/weller/martin/icee99.html.

Wong, C. J. (1999). *Developing an Internet-Based Distance Education Program: The Planning Phase.* SITE 10th Annual International Conference of the Society for Information Technology and Teacher Education. San Antonio, Texas.

Teaching and Learning Online: Lessons Learned

Donna J. Baumbach, Mary Bird, Janet Eastman, Kathy Katz
Florida Instructional Technology Resource Center at the
University of Central Florida
United States
baumbach_d@firn.edu, bird@pegasus.ucf.edu, jeastman@pegasus.cc.ucf.edu,
kkatz@pegasus.cc.ucf.edu

Abstract. Currently, there is a great deal of interest by school districts, educational software companies, teachers and others in providing staff development through the Internet. While research findings in this area are only now beginning to appear, a great deal can be learned from the "pioneers" in this area, including course developers, facilitators and participants. After designing and facilitating several online staff development components as well as from participating in some, the staff of a statewide technology resource center for educators began to document "lessons learned" from their experiences. In addition, a thorough literature review was conducted to validate these lessons and identify additional lessons. Online course developers, facilitators, and participants were surveyed to validate the lessons and to add additional ones. The result is a document, available in both hard copy and online, which delineates over 200 lessons learned in online staff development from three different perspectives.

Introduction

At a time when teachers face growing needs for ongoing professional development, online courses and components, delivered via the World Wide Web, are becoming increasingly popular. Individuals, institutions and commercial organizations are developing online staff development courses and lessons in order to effect more timely and, hopefully, less expensive training. Proponents see online learning as a potential solution to all training needs; opponents see it as less effective than face to face instruction. Meanwhile, course developers and staff development offices are looking for guidelines and ideas to make the most of this potentially exciting opportunity for leveraging existing resources, utilizing technology effectively and meeting the increasing demands of educators for updating and training.

While research findings are just beginning to make their way into the literature, a great deal is being written about distance learning, online training and "eLearning" for both K-12 students and their teachers. For educators, courses and components are being developed, offered, evaluated and revised. Participants are learning from online components, as are online instructors, those charged with facilitating the learning experiences and developers, those who design the instruction. We can learn a great deal from these "pioneers."

Background for the Project

The Florida Instructional Technology Resource Center (ITRC) at the University of Central Florida has been supporting educators statewide for 18 years. Recent efforts by the ITRC have focused on web-based tools and staff development. The ITRC staff has developed online staff development components to assist teachers in several different areas: learning to integrate the Internet into the classroom, school library automation, online learning, and web-based tools for teachers. As a result of developing and offering these components, the ITRC staff has learned a great deal about what leads to successful online teaching and learning in the context of staff development for professional educators. A review of the literature and a survey of participants from a variety of online staff development programs resulted in a document that compiles these "lessons learned" in online staff development for professional educators. The document, available in hard copy and online in HTML and PDF, examines online learning from three different perspectives:

--*From course developers:* Those who are responsible for the creation of the course or component. They are responsible for choosing appropriate online activities, sequences, strategies and resources to match content and desired learning outcomes.

--*From course facilitators (or instructors)*: Those who are responsible for the day-to-day monitoring of the course, providing expertise in the course content as well as technical assistance and feedback on participants' progress. The facilitator may also be responsible for revising activities and lessons based on assessment data and participant input. (The course developer may also be the facilitator, but this is not always the case.)

--*From course participants:* The learners in online courses or components; in this case, participants are educators who have taken a course or component as part of their inservice training or for their own professional development.

The Document

These "lessons" have been gleaned from a thorough review of the literature—examining both print and web-based documents, which are listed in the "sources" section of the document. Additionally, a survey instrument presenting a draft of the "lessons" was emailed to over 200 developers, facilitators/instructors, and participants who reviewed, validated and critiqued the lessons and/or contributed additional lessons from their own expertise and experiences.

The document includes: 92 Lessons Learned from Developers: These are grouped by category: Planning; Contact and Support; Online Community; Content; Format; and Miscellaneous; 53 Lessons Learned from Facilitators: These include lessons learned about Contact and Support; Online Community; and Miscellaneous; and70 Lessons Learned from Participants: These include lessons about Pre-requisites; Course/Time Management; Communication; Online Community; Attitude; and Taking the Course.

A comprehensive reference/resource section and a listing of survey participants is also provided in the document. *Online Staff Development: Lessons Learned* can be viewed at http://www.itrc.ucf.edu/LL and free single copies can be ordered from that site as long as supplies last.

Conclusion

As we move toward more "anytime, anyplace" staff development, we would be well advised to take advantage of new technologies, research and lessons learned along the way. While not all "lessons" listed in this document apply to all courses or components, educators involved—or contemplating involvement—in any way in online staff development should consider each lesson.

As all educators know, "learning never ends." Now, through online staff development, there are more and more opportunities for educators themselves to continue to learn and to grow not only as participants, but as course designers and facilitators.

Acknowledgements

The authors wish to acknowledge the support of the Florida Department of Education, Bureau of Educational Technology and the School Board of Monroe County Florida, the findings of those who are conducting research and publishing in this area, and the contributions of online staff development "pioneers," including survey participants listed in the document and those who chose to remain anonymous.

A Hybrid Online Course to Enhance Technology Competencies of School Principals

Sally R. Beisser, Ph.D.
Drake University School of Education
Des Moines, Iowa USA
sally.beisser@drake.edu

Peggy E. Steinbronn, Ed.S.
Drake University
Des Moines, Iowa USA
peggy.steinbronn@drake.edu

Abstract: Administrative leaders do not necessarily perceive themselves as leaders in technology in schools. Educational administration graduate students in this study acknowledged that their computer skills were often surpassed by their own faculty, staff, or students. This paper describes an online graduate level course for future administrators, "Principles of Curriculum" (EDUC 276), taught at Drake University. The course was developed with on-campus face-to-face classroom meetings to build future administrator's skills and confidence followed by completion of the course using online web based instruction. Results suggest that administrators who completed the hybrid online course report lack of technology proficiency, have greater willingness to engage in distance learning, and provide technology leadership and support for teachers.

Administrative Leadership in Technology

Exemplary computer-using teachers differ from other teachers in a variety of ways. They teach in an exemplary instructional environment of collegiality and social networking where there is school support for technology. These teachers have strong academic backgrounds and are employed in schools with adequate financial resources and relatively small class sizes (Becker, 1994). Other factors include relevant staff development, on-site computer coordination, and technical assistance. However, a key participant in making these decisions is the building principal.

Today, prevailing views of leadership suggest that the principal's role should not be to direct others but to create a school culture in which decisions are made collaboratively. "Facilitative" leadership exercises power through others, not over them (Conley & Goldman, 1994). However, this leadership style emphasizes organizational culture, thus creating a dilemma for school leaders who wish to build technology-using teachers in their schools. On the one hand, school administrators have long realized that quality schools use technology effectively (Dwyer, 1994; Sivin-Kachala, Bialo & Langford, 1997; Kosakowski, 1998; Technology Counts, 2000). They know that technology-using teachers need technology training and support (Becker, 1994). On the other hand, building principals may lack technological skills themselves in order to provide facilitative leadership in making decisions to support staff development, computer coordination, and technical assistance.

Factors influencing the success of technology-rich schools include administrative support in the form of funding, restructuring schedules, physical space, and curriculum decisions to reflect a new learning environment (Glenna & Melmed,1996; Technology Counts, 2000). However, administrators in this study report that they need adequate skill development themselves in order to provide facilitative leadership in funded efforts, space and scheduling, and curriculum design to build or lead a technology-rich school.

Educational institutions have clearly recognized the need to prepare preservice and inservice teachers to make technology an integral part of their teaching and learning environments (Thompson, Schmidt, & Hadjiyianni, 1995; Davis, Kirkman, Tearle, Taylor, Wright, 1996; Pelligrino & Altman, 1997; Davis, 1998; Stuhlman, 1998; Strudler & Wetzel, 1999). Yet many school administrators seem to lag in their competencies and confidence in using computer technology for purposes beyond e-mail communication and word-processing capabilities. The "hybrid online course" was especially designed for educational administration graduate students at Drake University. It gave future principals an opportunity to develop their technology skills with a common goal to complete one-third of the course online, as well as to consider ways to support effective use of technology in their roles as school administrators.

Background of Web Course Development at Drake University

Drake University's web program, formerly called "Virtual University," began in 1997 with 12 online courses enrolling 149 students with 359 credit hours. This faculty driven web program operated on a budget with no funding for training and support. Faculty who participated did so because they were professionally interested in creating a web presence for the university in order to engage students in online learning. A "Director of Web Education" was appointed the following year. A faculty program called "Academic Computing Fellow, was also instituted. This program gives two faculty members the opportunity to give support to other web faculty, as well as to learn, create, and experiment with some of the more advanced technology features of web education.

In January 2000, an Internet System's Manager position was created to provide technical, pedagogical, and other training support for faculty. Workshops provided hands-on training to learn web software, principles of web design, and elements of effective online teaching and learning.

Faculty workshops provided instruction for interested participants to use WebCourse in a Box™, a commercial software for developing online courses. Academic Computing Fellows assist in this effort and provide one-on-one mentoring for faculty new to the online teaching environment. As web courses go "live" students enrolled in web courses also receive technical support from the Internet System's Manager when necessary.

Enrollment in the web program continues to increase. Currently Drake University offers 65 web-based course for a population of 5200 undergraduate and graduate students. This year 624 students took advantage of web-based learning opportunities.

Table 1: Web Course Enrollment at Drake University

Year	Number of Students (Undergraduate and Graduate)	Credit Hours
1999	433	1325
2000	817*	2440

*Note: Actual enrollment of 624 students resulted in 817 registrants because some students enrolled in more than one web course.

Elements of Successful Online Education Courses

Research studies indicate that online learning environments constitute additional space in which people can learn, teach, communicate, work, trade, and spend leisure time (Harris, 1998; Somekh & Davis, 1999; Picciano, 2001). Educators are well aware of the potential of web technology, have adopted it for creating new learning environments, and have harnessed its power for relevant educational uses (Mioduser, Nachmias, Lahav & Oren; 2000). For example, key features of web-supported courses include the sophisticated *manipulation of information*. Students generate, transmit, store, process, and retrieve information from online libraries, databases, journals, virtual museums, and other Internet repositories of information. The web also serves as a *communication facilitator* for e-mail, group conferencing, and threaded discussions enabling peers, instructors, and experts to collaborate. The web is a *creation environment* to allow students to generate and publish their own research or websites with minimal technical assistance. Finally, the web serves as an *instructional delivery medium* to disperse intellectual material, connect to relevant URLs, and assess student understanding through quizzes and feedback analysis.

Key Features in Developing "Principles of Curriculum" Online at Drake University

The hybrid online course, "Principles of Curriculum" used these key features in the development of the course. Specifically, educational administration students *manipulated information* in order to search ERIC databases, ERIC Digests, OERI Research Syntheses, and selected websites through WebCourse in a Box™ hotlinks in order to write required research papers. Students read books on educational issues or topics of interest. Following an analysis of their book, the assigned research paper provided a critique of the ways in which this author's work or point of view impacted their role as an administrator.

Communication was facilitated as students e-mailed one other and the course instructor using "Learning Links" featured in WebCourse in a Box™. Students also communicated with three others to provide critical feedback on their research papers. Class members had access to all posted research papers. One graduate student remarked, "I had three times the feedback on my work. Comments were very insightful." Another student in the class exclaimed, "In three years of grad school, I have never had an opportunity to read someone's research paper, thus being able to learn from their thinking and writing." Threaded discussions through the use of a forum were available to all class members. Access to course research and discussion was restricted to enrollees.

The online course provided a *creation environment* as educational administration students "uplinked" their research papers in the WebCourse in a Box™ student portfolio section. Practice time in the computer lab was provided during the on-campus portion of the course. Students were required to electronically publish their own research work, as well as access the work of their classmates. Four members built websites to share their research while others added resumes to their electronic portfolios.

In order to promote the *delivery medium* function of the online course, there were intellectual interactions with the assigned text readings on curriculum theory, educational theorists, and curriculum design. Students connected to relevant curriculum URLs, had a chance to respond to the textbook author's interactive website, completed quiz questions on the web, check their grades, and provided online feedback to the instructor. Interestingly, because the course feedback was requested online, the grad students referred to the technology components of the course. Their responses were favorable and encouraging. One student said, "I am a computer dinosaur. This course helped increase my skills and decrease my anxieties."

Online learning meets the needs of adult learners (Imel, 1998; Collis, Winnips, Moonen; 2000; Johnson, Aragon, Shaik, Palma-Rivas, 2000). It is an approach for integrating technology into adult learning. It helps students consider how technology can be used to support and expand learning in their role as a school administrator. Not only did the adults learn content through technology, they also learned about the technology itself. One student said, "At first, I was not thrilled to take the last block of instruction through the Internet. But, now I am now sold on it."

Specific to the hybrid course was the use of web-based courseware as more than an electronic syllabus. The web-based software was used to communicate announcements of encouragement, reminders of due dates, and trouble-shooting suggestions from other students who had solved specific problems relating to the technology.

Because most students did not have prior online course experience, class was held in the computer lab during the on-campus sessions. Working together initially helped build skills in a sequential, developmental process. Skills and strategies for solving problems were acquired gradually and in stages that were more or less predictable (Hilgard & Bower, 1974). Effective teaching must involve a sensitive assessment of the individual's status in the learning process, as well as a presentation of problems that slightly exceed the level already mastered. Tasks must be neither too easy nor too difficult to understand. Hunt (1961) describes this as the "problem of the match" based on the principle that learning occurs only when there is an appropriate match between the circumstances that the learner encounters and the schemata already assimilated into his repertoire. Technical assistance, provided by the Drake University Internet System's Manager, was critical in teaching appropriate skills and troubleshooting.

Technical support issues impact the success of an online experience. The learner's confidence and comfort level with the technology was enhanced when direct online instruction occurred prior to the online portion of the *Principles of Curriculum* graduate course. Besides direct instruction by the Internet System's Manager, hard copies of directions that included screen shots taken directly from the web course software was provided to the students. Students were given time to practice the various components of online interaction during the instructional time. This included posting to the forum, replying to someone else's post, uploading files, and submitting assignments and adding information to an online portfolio. Students were encouraged to log onto the course to ensure that technical difficulties could and would be kept to a minimum and/or eliminated prior to the online weekend. They were also encouraged to contact the Internet System's Manager to help smooth out any technical difficulties that might arise. Technical online support web pages linked to the course software, as well as a "Request for Technical Support" form was demonstrated for the students. Phone calls and/or email requests for technical help were encouraged to help the students successfully meet the course requirements during the final, online weekend of the course.

Features of the Drake Hybrid Online Course for Administrators

Student feedback revealed that the features of the online class that were particularly meaningful included:

-Building electronic portfolios
-Participating in threaded discussions regarding their research papers via the Research Forum.
-Strengthening their research skills.
-Completing one third of the course at a time and pace that was convenient for adult learners.
-Exploring technological resources and representing information in electronic forms.
-Becoming more confident and aware of what their computers can do in teaching and learning.
-Communicating effectively about complex processes (research and trouble-shooting).
-Becoming independent learners through their online experience, yet helping each other spontaneously and willingly in collaboratively ways.
-Increasing research and writing skills from exposure to quality work of others.
-Better problem solving and critical thinking skills utilizing technology

Conclusions:

In reality most educational administrative preparation programs lack sufficient technology instruction or support in using technology for administrators to assume new leadership roles. Many principals lack the necessary proficiencies to provide leadership and support to their faculty and staff members. Encouraging principals to use technology in teaching and learning is possible using effective strategies and shared experiences such as a hybrid online course designed to enhance technological competencies.

As Harrington (1991) suggests, there is a difference between preparing teachers to use technology and using technology to prepare teachers. If we only prepare teachers to use technology we limit the conception of the role of technology in education. Administrators, too, must be empowered to take more responsibility for both acquiring technological competencies and to facilitate technology usage and capabilities of teachers and students through effective leadership.

References:

Becker, H.J. (1994). How exemplary computer-using teachers differ from other teachers: Implications for realizing the potential of computers in schools.

Collis, B. Winnips, K., Moonen, J. (2000). Structured support verses learner choice via the WWW: Where is the payoff? *Journal of Interactive Learning Research, 11*, (2), 131-162.

Conley, D. and Goldman, P. (1994). *Facilitative leadership: How principals lead without dominating*. Eugene Oregon: Oregon School Study Council.

Davis, N. (1998). *Images for teacher education*. [Online]: World Wide Web: http://telematics.ex.ac.uk/fr-tltp.htm

Davis, N., Kirkman, C., Tearle, P., Taylor, C., Wright, B. (1996). Developing teachers and their institutions for IT in education: An integrated approach. *Journal of Technology and Teacher Education, 4*(1), 3-18.

Dwyer, D. (April, 1994). Apple classrooms of tomorrow: What we've learned. *Educational Leadership*, 51(7), 4-10. (EJ 508281)

Education week on the web. *Technology Counts: Schools and reform in the information age. A special report.* [Online]:http://www.edweek.org/sreports/tc/ (version current at April 2000).

Glenna, T. K. & Melmed, A. (1996). Fostering the use of educational technology: Elements of a national strategy. *A Rand Report*. Santa Monica, CA: Rand. [Online]: World Wide Web: http://www.rand.org/publications/MR/MR682/contents.html (Version current at April 1998).

Harris, J. (1998). *Virtual architecture: Designing and directing curriculum-based telecomputing*. Eugene, OR: International Society for Technology in Education.

Harrington, H. (1991). Normal style technology in teacher education: Technology and the education of teachers. *Computers in the Schools, 8*(1/2/3), 49-57.

Hilgard, E.R. & Bower, G.H. (1974). *Theories of learning*. 4th ed. Englewood Cliffs, NJ: Prentice-Hall.

Hunt, J.M. (1961). *Intelligence and experience*. New York: Ronald Press.

Imel, S. (1998-00-00.). Technology and Adult Learning: Current Perspectives. ERIC Identifier: ED421639. *ERIC Digest No.197*. Columbus, OH: ERIC Clearinghouse on Adult Career and Vocational Education.

Johnson, S.D., Aragon, S.R., Shaik, N. & Palma-Rivas, N. (2000). Comparative analysis of learner satisfaction and learning outcomes in online and face-to-face learning environments. *Journal of Interactive Learning Research, 11*,(1), 29-49.

Kosakowski, J. (1998). The benefits of information technology. Syracuse, NY: *ERIC Digest Clearinghouse on Information and Technology*, ERIC Identifier: ED420302. Publication Date: 1998-06-00.

Mioduser, D., Nachmias, R., Lahav, L., Oren, A. (2000). Web-based learning environments: Current pedagogical and technical state. *Journal of Research on Computing in Education,33*(1), 55-76.

Martinez, M. & Bunderson, C.V. (2000). Building interactive world wide web (Web) learning environments to match and support individual learning. *Journal of Interactive Learning Research, 11*, (2), 163-195.

Pelligrino, J. & Altman, J. (1997). Information technology and teacher preparation: Some critical issues and illustrative solutions. *Peabody Journal of Education, 72*(1), 89-121.

Picciano, A.G. (2001). *Distance learning: Making connections across virtual space and time*. Upper Saddle River, NJ: Merrill/Prentice Hall.

Sivin-Kachala, J., Bialo, E. & Langford, J. (1997). The effectiveness of technology in schools. *ERIC Database* ED 413875. Available: [On-line] World Wide Web: http://www.spa.org

Somekh, B. & Davis, N. (1999). *Using information technology effectively in teaching and learning: Studies in pre-service and in-service teacher education*. New Fetter Lane, London: Routledge.

Strudler, N. & Wetzel, K. (1999). Lessons from exemplary colleges of education: Factors affecting technology integration in preservice programs. *Educational Technology Research and Development*, 63-82.

Stuhlman, J. (1998). A model for infusing technology in teacher education programs. *Journal of Technology and Teacher Education, 6*(2/3), 1125-1140.

Thompson, A.E., Schmidt, D. & Hadjiyianni, E. (1995). A three year program to infuse technology throughout a teacher education program, *Journal of Technology and Teacher Education, 3*(1), 13-24.

Exploiting and Evaluating A Web-Based Learning System
Six Days and Seven Nights In The Basement

John Knight
Department of Philosophy
University of Wisconsin-Waukesha
United States
jknight@uwc.edu

Robert Bermant
Department of Psychology
University of Wisconsin-Waukesha
United States
rbermant@uwc.edu

Abstract: Discussion of the value of Web-Based Learning System (WBLS) takes place at two levels, the theoretical and the practical. The practical value of a WBLS depends on numerous factors including: extent of course enhancement, degree of dependence on web-based technologies, the software platform, technology support, students skills, and institutional issues. At the theoretical level the debate on the value of a WBLS occurs both within the discipline as well as within academia itself. This report examines our experience with a WBLS in the context of a new integrated studies course.

We teach at the University of Wisconsin-Waukesha, a two-year transfer institution within the University of Wisconsin System. It is a commuter campus without residence halls. Most of our students work at least twenty hours a week. Over half of our students are from the lower quartiles. Faculty at our institution typically teach 12-credit hours each semester and in addition they are expected to contribute in a variety of ways outside of the classroom, i.e., student advising, committee service, and professional activity.

The institution provides office computers, network access and a web-based learning system (WBLS) for its faculty. While significant dollars are targeted toward the development of on-line, asynchronous courses, there few institutional resources allocated for web-enhanced courses. This despite the fact that the faculty is expected to develop and support web-based activities for their courses in addition to their other professional and pedagogical responsibilities, i.e., "six days and seven nights in the basement."

Furthermore, instructors on our campus have little technological support. For example, our computer center staff is unable to assist either instructors or students having problems with a WBLS or other instructional technologies. Technology assistance is the responsibility of a limited-term employee, who is a half-time student at another campus. Needless to say, much of time the instructor is left to his or her own ingenuity to figure out the solutions to technical problems. These problems range from helping students login to the system, to discovering why the colors they have chosen for their personal web pages look different when they view them at home. The upshot is that at the beginning of the semester we devote many hours to wrestling with these problems while at the same time trying to prepare for and teach the course itself.

Currently, there is really little merit recognition for including web-based activities into our courses. Rather, it is largely a matter of instructor choice. And that choice may be driven more by institutional priorities than by compelling research demonstrating the soundness and efficacy of web-based pedagogies. Although there is ample evidence that students "like" web-based experiences, important questions about the educational value of such experiences remain unanswered. Does more technology mean better pedagogy? Just because we can now put materials on the web and provide virtual discussion forums for our students, should we? The problem is we simply do not know. It seems that such questions ultimately focus on resource deployment. When much of what we do or do not do is driven by enrollment, it is important to determine how to allocate limited dollars. Do we invest in technological infrastructure, while encouraging the deployment of web-enhanced, hybrid, and asynchronous courses? Or do we support opportunities for greater student-faculty contact, smaller classes, and first-rate teachers. Obviously these choices are not mutually exclusive, but the tension they engender is very real and it has implications for our future as an institution as well as for our students.

A primary motivation for integrating a WBLS into courses is course enhancement. There are several ways instructional technologies can enhance a course. Clearly they encourage interpersonal communication. Discussion forums, group activities and email permit asynchronous exchanges to occur. Student and faculty home pages help in getting to know something about each other. In the absence of opportunities for face-to-face interaction a WBLS can help to foster communication among students and faculty.

However, our aim in using the web is not communication for communication's sake. Rather we want our students to present clear, coherent, and consistent arguments. We seek to accomplish this in three ways. First, we try to be role models. We provide examples of the kind of analysis we expect. Whether we are presenting our own views or discussing the views of another philosopher or psychologist we emphasize the importance of justifying our conclusions. We provide hypertext links to sites that exemplify empirically based and logically sound arguments. Second, we ask students to evaluate each other's arguments. And third, we take the arguments presented on the course web site back into our classes to stimulate discussion. This is especially helpful where we have students who don't say much in class. We use their web comments to get them involved in the face-to-face discussion. The technologies used in our courses also enable us to demonstrate the richness of resources available on the web. Not only do we provide supplementary course materials but external links as well. As we discuss each main topic we provide students with a set of hypertext links that elaborate on the issues. Often the links are directly to the authors who write the articles or to discussion groups currently analyzing the concepts and arguments. Along with web discussions we also present self-check quizzes. The quizzes receive a fair amount of attention. Students will often have follow-up questions about their answers. Thus web-based instruction not only aids in teaching our courses but enables us to tutor the course as well.

Web-enhanced courses present unique involvement challenges. It is difficult to motivate student to participate in web projects without grade inducements. We have offered courses that have included web components where the web work was not required for the class grade. While there was initial interest, the web activity dwindled as the semester progressed. In fact, according to class surveys, one of the student's greatest concerns about web work is the time it takes. Since most of our students have jobs and many have family obligations, they must carefully budget their time. When we first integrated web work into an interdisciplinary course, we received a lot of student complaints about what they perceived as excessive work. In response to these concerns we have since cut down on the web requirements.

In large classes it takes a fair amount of time to read, record, and respond to the answers to discussion questions. We estimate that in addition the start-up time, web work adds about one hour each day per class. In order to track students' responses to their web experiences we conduct continuous student evaluations throughout the semester. We ask students to keep logs as well as having them fill out questionnaires. The tracking information is very useful in spotting problems, making mid-course corrections, and insuring that our web demands are not excessive.

There are a wide-range of philosophy and psychology courses at all academic levels now offered on-line. Additionally, there are electronic journals, articles, papers, opinions, and discussion forums on the web. Our professions have certainly embraced the web as a vehicle for exchanging information. The sheer quantity of information is overwhelming and often this makes it difficult to find a useful signal in what sometimes seems little more than a sea of random noise. Within the disciplines there is debate over the advantages and disadvantages of web v face-to-face instruction. Do on-line courses tend to negate the dynamic interaction needed to teach philosophy and psychology? Would Socrates ever teach an on-line course? Can one "deliver" instruction as if it were a pizza? Are courses that are taught on-line better than no courses at all? Fortunately value-added or web-enhanced courses need not answer these questions, although they beg for answers. Instead, we believe that we have the best of both worlds. We interact in-person with our students. Also we exchange ideas with our students over the web. We can take advantage of the richness of information that the Internet makes available, while preserving and celebrating the face-to-face interaction of the classroom. Most of our students are not well adapted to the demands of independent study. For them and for us as well, value added learning technologies provide another means for reinforcing and enriching in-class instruction.

Using Constructionist Principals In Designing And Integrating Online Collaborative Interactions

J. Michael Blocher, Ph.D.
Gary Tucker, Ph.D.
Center for Excellence in Education
Northern Arizona University
United States
Michael.Blocher@nau.edu
Gary.Tucker@nau.edu

Abstract: This paper describes a study that took an action research approach to investigate learners' experience using CMC to engage in a collaborative project in an online learning environment. Communication messages were archived for analysis and a post-questionnaire was administered to provide feedback on the students' experience with the project. Findings from the study were then used by faculty at Northern Arizona University (NAU), a small institution that serves mostly rural students in Arizona, to design and implement one of the foundational web-based courses in their online Master's of Education in Educational Technology degree. The course design for *ETC 567: Technology, Society, and Education* was based on findings from the described study investigating online collaborative interactions and founded on constructionist principals to enhance learner interaction through collaborative writing projects in the online learning environment. Furthermore this paper provides examples for practitioners desiring to integrate collaborative projects in online learning environments.

Introduction

In the 1960's, Seymour Papert and colleagues initiated a research project on how children think and learn and to develop educational approaches and technological tools to help those children learn. From this beginning has evolved a theoretical foundation, which has become known as constuctionism. The term constructionism, first coined by Papert (1991), involves two main tenets. First, it affirms the constructivists view of learning and asserts that knowledge is not simply transmitted from teacher to student, but actively constructed by the mind of the learner (Kafai and Resnick, 1996). To this constructionism adds the idea that people construct new knowledge with particular effectiveness when they are engaged in constructing *personally meaningful products* (Bruckman & Resnick, 1996). Thus constructionism involves two intertwined types of construction: the construction of knowledge in the context of building personally meaningful products (Kafai and Resnick, 1996). It is through this avenue of "constructing" that technology can be integrated into the instructional process such that it promotes teachers to teach from a constructivist model.

Moore (1989) described interaction within distance education as that interaction between a) the learner and the content, b) the learner and the instructor, and c) the learner with other learners, and suggested that it is most desirable to incorporate all three types into instruction. Interaction between these shareholders permits sharing of ideas, concepts and valuable feedback. Hillman, Willis, & Gunawardena (1994) suggest that learners also interact with the instructional interface – the technology.

In today's distance learning environments Computer Mediated Communication (CMC) becomes the venue or vehicle where the social construction of knowledge (Vygotsky, 1978) occurs for learners to build their understandings through their communication, social interactions and collaborations. CMC supports collaboration among learners, instructors (experts), content, media, and writing/composition (Misanchuk, Morrison, and Peterson, 1997; Sproull and Kiesler, 1991; Seagren and Watwood, 1997; Gunawardena, Lowe, and Anderson, 1998; Jonassen, 1996; Moore and Kearsley, 1996; and Harasim, 1996). The learning and interaction that occur in environments that employ CMC encourage collaboration and teamwork and require active rather than passive participation.

The Study

An action research study was conducted with fifty-seven graduate students from two different sections of the same course taught by two instructors who team-taught both sections at a large southwestern university. The study included one traditional face-to-face section that met once a week in a computer lab and another section that was televised over an Interactive Instructional Television system (IITV). To enhance these students' learning experience and increase peer to peer interaction, the sections were taught as one class and all students were required to interact with one another via Soft Arc's First Class® computer conferencing system in both asynchronous and synchronous sessions. In addition, the First Class® venue was used as a location to upload assignments and other documents for the collaborative assignment. Furthermore, students were given a collaborative project where they would use CMC and First Class® to organize and communicate on their common task.

Anecdotal data were collected via the First Class® conferencing system in the form of a discussion of the collaborative project. Students were also asked to respond to a questionnaire and then reply to their peers' responses. The questionnaire was designed to elicit basic information about their experience and asked for general comments for making the assignment better.

Findings

The results from this study indicated that these individuals successfully used CMC for this student collaboration project. Overall students reported in greater numbers that the experience was better than they expected. However, as in all classroom collaborations, this activity did have some difficulties that arose to flavor the students' experience. While students generally reported that it was better than expected and overall a positive experience, they also made suggestions that they felt would have made it a better experience. Those suggestions included some very specific changes.

Overall students reported in greater numbers that the experience was better than they expected.

60.78%	Reported that the collaborative project **went better than they expected** and felt it was a positive experience.
25.49%	Reported that the collaborative project **went better than they expected** and felt it was a positive experience.
13.73%	Reported that the collaborative project was **neither better nor worse than they expected**.

Table 1. Questionnaire Results

Positive comments included:

- "It was actually better than I expected. The hardest part was our first chat. After that it flew. I expected a lot more communication problems and we actually only had one. I also had a very good group. I have had so many projects where group members did not pull there weight."

- "Our group (The Red Team from Group 3) had a good time doing our web pages! We didn't have any serious topics in mind so we had a little fun! The experience was better than I expected. Since this was an on-line collaborative effort, I thought we were going to have trouble communicating, but we didn't!"

- "What I liked most about the project, and about my group, was our helping each other out. Sometimes one of us knew something and other times the other group members figured things out. We worked really well together. We weren't trying to outdo each other's pages."

- "Though my group experienced a few glitches, I feel working on the group project collaboratively online was very interesting. It turned out better than I expected. I thought it would be very difficult to get things organized. The members of the group were at different levels of watching the class, and on downloading and understanding the workings of Claris Home Page. This is why I thought it would have been difficult. It did not turn out being as hard as I had expected."

Negative comments included:

- "My experience with the online collaborative activity didn't go as well as I would have liked it to. I moved house in between all of the collaboration and had a lot of other work to do with my other classes. To top it all off, something went wrong with my computer and I had to get it fixed. By the time I got in contact with my group, everything had been decided for me as far as what page I would do and the subject which I knew nothing about. So I had to scramble for ideas and research the web for images etc... and get it all done by the due date. Needless to say, there was nothing that I liked about this activity. It was hard to connect our ideas (for me) without using the telephone because of the time element involved. It would have been better if we were given a list of phone numbers at the start so that I could have at least gotten to talk with my group members as to what all of our duties would be and a topic that was agreeable with all. Another suggestion would be to have a sign in place where people could choose to be in a certain group and talk/meet/chat at a common time. It's hard to collaborate when there is a missing link."

- "It was worse than I expected simply because of the technical problems I encountered on my end. But though it all I learned something I could use."

- "It turned out worse than expected, due to delays in getting input from team members, and a team member missing from the organizing chat. Most of our team's difficulties were from outside sources. We didn't have a lot of technical problems because I already have some web page construction knowledge. But we were delayed one day when the teammate who was supposed to be designing the colors, college name, etc. could not get one of the ASU computers to work. So better, quicker help for her would have made it better for the team."

- "I found the online collaborative activity to be frustrating. Perhaps because it was my first attempt. It was worse than I expected. We had a hard time getting together and communicating. It was helpful however to know someone else was as frustrated as I was and we did figure out how to solve some of our technical problems. I'm not sure what could have made our experience better. Each one of us was at a different skill level and that made it hard. This wasn't anyone's fault - it just increased the anxiety and frustration level. I think group projects via distance learning can work - I think it takes practice, patience, consideration and commitment. I would not be opposed to doing another group project in this manner."

Interestingly, many indicated that they were surprised that some expected difficulties did not occur and that unexpected difficulties did occur. For example one student commented,

- "I think the group project was better than I expected. My fear was that one or several students in the group and team would not be able to meet to chat due to excuses, meaning that the assignments may not be thoroughly completed. However, I am happy to report that my group and team had no problem at all chatting and coordinating our ideas, though there ultimately was a little problem linking one of the pages to the other two. On th other hand, I guess that I may have bee fortunate by being placed in a group with "serious" students since I heard of others who were less fortunate and could not complete the assignment on time nor chat at the scheduled chat times."

Another student commented,

- "The group project was neither better nor worse – I've learned not to predict in this class. I was surprised at what was easy and what was hard. I thought it would be really hard to link the three pages, and it was easy. The problem was that two of us had problems getting our images uploaded – I thought it would be automatic. Constructing the web page itself was very easy."

Course Design

Based upon the findings from the study, a re-design of *ETC 567: Technology, Society, and Education* was conducted and is being taught implementing many of the recommendations from this study and based upon constructionist principals where students interact and construct meaningful products. Two different types of *very structured* online interactive collaborations were set up to foster better groups, greater support, and leadership. Using both synchronous and asynchronous CMC systems provided learners with several venues for interaction. First, a Homework Network was devised and scheduled which groups students into rotating teams of three for specific peer evaluation of reaction papers written in response to weekly reading assignments. Second, semester-long Discussion Groups were formed in teams of three.

The Homework Network

The Homework Network is designed to provide a way of interacting with course topics, readings, and other members of the class in the online environment. The objective of the Homework Network is for each individual student to complete the assigned readings, create a one-page reaction paper on the assigned "Topics of Discussion" based on the readings and personal knowledge, and share this paper with the members of their network.

Students complete 6 Homework Networks through out the course and are given a grouping assignment at the beginning of each. Once Homework Networks are assigned, they are instructed to establish email contact with the others in their network as soon as possible. They then write and email a copy of their reaction paper to the other two members of their Homework Network as well as their instructor. Once they receive their peers' papers, they read and rate the paper using a rubric (see Table 2.) and email the rating to the instructor.

Paper illustrated both depth and breath of thought	Paper illustrated either depth or breath of thought.	Paper illustrated neither depth nor breath of thought.	I did not receive the paper.
5	4	3	0

Table 2. Grading Rubric

The Discussion Group

The Discussion Group is a semester-long team with each member having a very specific role. The roles will rotate after each assignment so that each person completes each role by the end of the semester. The roles have been designed to provide structured leadership and include; a) Presenter, b) Team Leader, and c) Observer/Commenter.

The Presenter

During the semester, the instructor will present three "condition of the world" topics of discussion based on the readings for the course and the group discussions. The Presenter will examine the topic of discussion and from that determine a specific direction that the group will pursue. The Presenter can ask for input from the group if they wish. Based upon the direction of thought, the Presenter begins a Threaded Discussion by posting a question for discussion on the Discussion Board.

Each member of the team will be required to post two substantive responses each week to the question posted by the Presenter. The Presenter then facilitates the discussion. If new threads of discussion are to be begun, the Presenter must begin them. Other members can suggest new threads but it is the responsibility of the Presenter to post them.

The Team Leader

The role of the Team Leader is take the responsibility for leading the cooperative group to produce a 3 to 5 page position paper on the topic of discussion (assigned by the instructor). Through cooperative effort directed by the Team Leader, the Discussion Group uses the Virtual Chat "whiteboard" to facilitate the creation of the position. The paper should be based upon the threaded discussions of the Group Discussion Board and the discussions in Chat. The Team Leader then takes the suggested changes and creates a final document, which he or she emails to the Instructor. The Team Leader also evaluates the performance of EACH member of the group but NOT themselves.

The Observer/Commentator

(Note: In groups that might have 4 members these roles can be separated. If there are only 3 in the group then both roles will be completed by one individual).
The role of The Commentator is to facilitate the Virtual Chat. Upon the completion of the Chat conference, the Commentator is to write a summary of the discussion, and email the document to the instructor.

The role of The Observer is to write a reflection and email it to the instructor on the group dynamics that occurred during the creation of the position paper. The reflection is to discuss what went well and areas of difficulty in creating the product. In the reaction, they are also to comment on the participation of each member, and use the evaluation rubric above evaluate the performance of the Team Leader.

Summary

As web-based courses and degree programs continue to be developed at an increasingly rapid pace, the literature suggests that practitioners design develop learning environments that foster learner interaction and collaboration. The faculty at Northern Arizona University's Educational Technology department strive to do so; providing a learning experience that is rich with interaction and that is based upon constructivist learning theory. The foundational course *ETC 567: Technology, Society, and Education* provides these graduate Educational Technology students with the opportunity to begin their M.Ed program by using constructionist principals in designing and integrating online collaborative interactions.

References

Bruckman, A., and Resnick, M. (1995). The MediaMOO Project: Constructionism and Professional Community. *Convergence, 1*(1): 94-109.

Gunawardena, C. N., Lowe, C. A., and Anderson, T. (1998). *Transcript analysis of computer-mediated conferences as a tool for testing constructivist and social-constructivist learning theories.* In: Distance Learning '98. Proceedings of the Annual Conference on Distance Teaching & Learning (14th, Madison, WI, August 5-7, 1998).

Harasim, L. (1996). Online education. In T.M. Harrison & T. Stephen (Eds.), *Computer networking & scholarly communication in the twenty-first-century university.* (pp. 203-214) Albany, NY: State University of New York Press.

Hillman, D. C., Willis, D. J., & Gunawardena, C. (1994). Learner-Interface Interaction in Distance Education: An Extension of Contemporary Models and Strategies for Practitioners. *The American Journal of Distance Education 8*(2): 30-42.

Jonassen, D. H. (1996). *Computers in the classrooms: Mindtools for critical thinking.* Englewood Cliffs, NJ: Prentice Hall.

Kafai, Yasmin B. and Mitchel Resnick (1996) Introduction. In K.B. Kafai & M. Resnick (eds.), *Constructionism in Practice, Designing, Thinking, and Learning in a Digital World.* Hillsdale, NJ: Lawrence Erlbaum Associates

Misanchuk, E. R., Morrison, D., and Peterson, M. E. (1997). *A beginner's guide to computer conferencing.* Paper presented at the Annual Conference of the Association of Educational Communications and Technology. Albuquerque, NM, February 12-16, 1997.

Moore, M. G. (1989). Three types of interaction. *The American Journal of Distance Education. 3*(2), 1-6.

Moore, M., and Kearsley, G. (1996). *Distance education: A system view.* Belmont, CA: Wadsworth Publishing Company.

Papert, S. (1991). Situating constructionism. In I. Harel & S, Papert (eds.), *Constructionism.* Norwood, NJ: Abex.

Seagren, A. and Watwood, B. (1997). *The virtual classroom: what works?* In: Walking the Tightrope: The Balance between Innovation and Leadership. Proceedings of the Annual International Conference of the Chair Academy (6th, Reno, NV, February 12-15, 1997).

Sproull, L. S., and Kiesler, S. (1991). *Connections: New ways of working in the networked organization.* Cambridge, MA: MIT Press.

Vygotsky, L. S. (1978). *Mind and Society.* Cambridge, MA: Harvard University Press.

Learner Styles and Potential Relations to Distance Education

Walter C. Buboltz Jr.
Department of Psychology and Behavioral Sciences
Louisiana Tech University
United States
Buboltz@woodard.latech.edu

Lamar Wilkinson
Department of Psychology and Behavioral Sciences
Louisiana Tech University
United States
Lamar@woodard.latech.edu

Adrian Thomas
Department of Psychology and Behavioral Sciences
Louisiana Tech University
United States
Thomas@woodard.latech.edu

Steve Jenkins
Department of Psychology and Behavioral Sciences
Louisiana Tech University
United States
smjenkins@woodard.latech.edu

Abstract: This article reviews the literature on cognitive/learning styles and how these learning styles can impact the design, implementation and instructional strategies used in the distance education environment. Several cognitive/learning styles have been examined over the years within the educational realm, but few of these cognitive/learning styles have been taken into account in the distance education environment. Several cognitive/learning styles are reviewed and the implications of these cognitive/learning styles are examined in the context of distance education. Without acknowledgment of the differences between students and incorporating these differences into the presentation of materials, evaluation and feedback we may be providing less efficient learning environments for students. As technology continues to change it is imperative that we as educators taken into account the many differences that students bring to the educational environment. This appears to be even more important in the distance education environment as the diversity of students appears to be larger then within the traditional educational environment.

Introduction

As technology and computers continue to infiltrate our schools and institutes of higher education, research and theory is suggesting that these technologies can go a long way in creating complex and rich learning environments (Freedman & Liu, 1996). The use of these new technologies has lead to an explosion in distance education through various mediums (compressed video and Internet courses). With this rapid move toward the use of distance education, researchers and theorist's alike have not had the opportunity to examine the effects of these new technologies and how best to implement them for maximal student performance. Only by examining these variables can we effectively design and implement distance education that will lead to maximal learning and performance. Distance education may not be for everyone. Not all faculty members are suited for the varied modes of teaching, nor are all students appropriate for attempting the various forms of distance learning. It would appear that to obtain the highest quality teaching and learning from a distance, consideration of theoretical perspectives, subject content, learning context and learner characteristics need to be considered. In traditional education many aspects of the learner, learning environment and the interaction between the two has been examined. This has not been the case for distance education. This article reviews the research on learning styles (cognitive styles) and how they may interact in the distance education environment. Finally, recommendations are made on how to best implement distance education to meet the unique needs of students with different learning or cognitive styles.

Cognitive/Learning Styles

Research over the years has indicated consistently that people exhibit individual differences in the processing of information and problem-solving. The construct of cognitive styles was originally proposed by Allport (1937) and has been refined and further expanded by several others (Messick, 1976; Smith, 1984; & Tennant, 1988). Based on the various definitions that have been proposed, cognitive/learning styles refer to an individual's characteristic and consistent predisposition of perceiving, organizing, processing, and problem solving. Typically, learning styles involve four basic steps of information processing. These four steps include: 1) data collection or gathering information; 2) relating information to current knowledge; 3) analyzing logical connections between concept possibilities and consequences of actions; and 4) evaluating the outcomes. Over the years different researchers have focused on different aspects of cognitive/learning styles including: a) cognitive complexity vs. cognitive simplicity; b) field dependence vs. field independence; c) impulsive vs. reflectivity; d) organizer vs. non-organizer; e) scanning vs. focusing; f) simultaneous vs. successive; and g) holist vs. serialist. Taken together, all of these styles have implications for the learner and instructor as they will interact in the learning and produce a variety of results depending on factors such as, material presentation, method of instruction, format of evaluations and feedback.

In general, most researchers tend to use cognitive styles and learning styles interchangeably, which will be done in the remainder of this article. Cognitive/learning styles have been viewed in three major respects structure, process, or both structure and process (Tennant, 1988). Additonally, Ausburn and Ausburn (1978) have proposed that cognitive/learning styles are characterized by three important properties: generality and stability across tasks and over time, independence of cognitive/learning styles from traditional measures of general ability, and finally the relationship between cognitive/learning styles and specific abilities, characteristics, and learning tasks. At this point is appears that a brief review of some of the more pertinent cognitive/learning styles is warranted. These will include field independence-dependence, holist-analytic, Verbal-Imagery, and sensory preferences.

Field Independence vs. Field Dependence

Witkin (1979) defined field independence-dependence as value-neutral and is the ability to distinguish key elements from a distracting environment. Research on field independence-dependence has found that field independent individuals are more autonomous in the development of cognitive restructuring skills, while field dependent individuals tend to be more autonomous in developing interpersonal skills. Additionally, other research has shown that field independent people tend to be more intrinsically motivated, enjoying individual learning, while field dependent people like cooperative learning and appear to be externally motivated. Additionally, research has demonstrated that field independent individuals tend to be analogical problem solvers, as well as perform better in situations that require parallel processing, while field dependent individuals tend to perform better in serial processing conditions and are non-analogical problem solvers. It should also be noted that some gender differences have been found in this dimension of cognitive styles, with males being more field independent and females being more field dependent (Antonietti & Gioletta, 1995). As can be seen the interaction of the field independence-dependence dimension would have some major implications for the presentation of material and how individuals may learn the material.

Holist-Analytic

Within the holist-analytic distinction, holists tend to view a situation as a whole, while analytics view situations as composed of parts and tend to focus on only one or two aspects. This dimension of cognitive/learning styles is not an all or nothing proposition, and many people fall in the middle and can switch between the two modes and thus, have the benefits of both. In general, holists are able to more easily see the whole picture and draw conclusions between large pieces of information. In contract, analytics may have difficulties in seeing the whole picture due to their proclivity to focus on parts. However, there are advantages to being a analytics, as they are able to break the whole into parts and see the interconnections between the parts that make the whole. Clearly, each of these styles has implications for the presentation of material in the distance education classroom and how individuals may learn the material.

Verbal-Imagery

Verbal-imagery style refers to how individuals represent information in their internal mental apparatus. Verbal individuals tend to represent information during thinking in a verbal format, while imagers tend to represent information while they are thinking in terms of visual images. Individuals have related both of these forms of representing information in the internal mental apparatus to various forms of material presentation and subsequent learning. Generally, imagers tend to learn best from pictorial presentations, while verbalisers learn best from verbal presentation. Additionally, due to the nature of the processing of information, imagers recall highly descriptive text more efficiently than verbalisers as they are able to produce highly complex and rich images, which aid in memory formation. Based on this, it would appear that individuals would learn best when information is presented in a mode that allows them to take advantage of their preferred mode of mentally representing information. This would tend to make sense as individuals are more efficient with the use of their prefered mode and can make more connections with other material that has been encoded into their mental apparatus via their preferred mode.

Sensory Preference

A sensory modality is a biological system that interacts with the environment through one of the basic senses to take information into the organism for further processing. The major sensory modalities are auditory, visual, tactile, or some combination of these. Dunn and Dunn (1979) found that roughly 30% of American students are auditory, 40% are visual and 30% are tactile and the remainder is some combination of the three. Each of these modes of taking information into the organism has implications for learning and performance. Research has indicated that visual processes may be incompatible with abstract thinking and thus, information that relies totally on visual information and processing may interfere with abstract thinking. Other research has demonstrated some gender differences in sensory preferences, with females being more verbally oriented and males being more visual oriented.

Taken together, cognitive/learning styles have implications for the delivery of instructions to students in both the traditional and new distance education formats. One approach will not work, as each student brings his/her own style to learning, and as educators we need to tailor our instructional strategies and modes of delivery to meet the needs of students. In the traditional classroom, with an instructor present, the instructor can alter how he/she interacts with each student to help meet the learning style of the student and promote maximal performance. In distance education it may be impossible to meet the unique learning style of each student, due to technological drawbacks and other factors related to the use of technology. However, we believe that by being aware of cognitive/learning styles of students, distance educators can more accurately design distance education opportunities to make them the most useful for a variety of students.

Characteristics of Distance Education

Distance education is emerging as viable force in the education of individuals that appears to be gaining in popularity. The growth in distance education appears to be related to the demand for education and training from a wide variety of individuals and groups, which normally would not have access to education through any other means. The primary characteristic that distinguishes distance education from other forms of education is the separation of student from instructor, as well as the separation between students. Due to this separation between individuals, there is not natural interpersonal interaction. Additionally, there is a separation between equipment and facilities, and the context in which learning is to be situated. Keegan (1986) defines distance education along six dimensions which are as follows: 1) role of educational organization, 2) place of technological medium, 3) lack of interaction between student and teacher, 4) two-way communication, 5) distance between the learners, 6) industrialization. Within the distance education field there are two primary types of distance education. The first type of distance education focuses structured, programmed learning materials, and the other is based on the use of technological computer communication. The former approach views the programmed materials as the teacher, while the latter views the computer as a channel for communication between students and the instructor.

Within the distance education movement, characteristics of the learner have also been examined as to how they may differ from traditional students and how the distance education format may impact learners. Generally, findings indicate that the typical distance education student is an adult learner and that certain styles of learning may be more conducive for distance education learning. Typically, students who attempt distance learning at this time tend to be intrinsically motivated and rely more on deep approaches to learning then more traditional students, who rely more on rote learning. Finally, attitudes toward distance education may play a role in how students accept and perform in the distance education environment. Students who approach the environment and learning tasks in a more positive light are more likely to learn and perform in this environment. Finally, it should be mentioned that distance education is not static, but is dynamic in nature with constant technological changes that lead to a variety of delivery modes and instructional strategies that are constantly changing and may not lead to a stable learning environment. In summary, the primary distinguishing feature is the separation between learner and instructor and that distance education and distance learners appear to exhibit different characteristics from more traditional face-to-face instruction.

Design of Distance Education with Cognitive/Learning Styles in Mind

Before an instructor can take into consideration the cognitive/learning styles of students, the instructor must be aware of them. Thus, the first component of incorporating these styles is to assess the cognitive/learning styles of the target audience. This can be done formally or informally, either before the instructor begins or during the first instructional meeting. Once this analysis has been conducted, the instructor can get a feel for the cognitive/learning styles of the students and tailor the instruction and presentation of materials to meet their individual needs. Instructors should include instructional materials that meet the styles of students, thus creating a learning environment that allows students to maximally use their preferred style. The following focuses on incorporating methods that match the style of students, and what evaluation techniques would be most useful given the styles of students.

To facilitate this process the instructor should be aware of several other factors that can contribute to effective teaching and learning. Specifically, instructors should match instructional materials with learning styles. Within this domain, there are several characteristics that an instructor should be aware of in selecting a teaching method, a few of which will be highlighted. Content should match the verbal-visual style of students. Thus, instructors should always provide verbal as well as pictorial depictions of information to accommodate the styles of students. Students who are more verbally oriented will be able to grasp the information, while at the same time, individuals who are more visually oriented will be able to integrate and process the information. Unfortunately, this is not the case in most circumstances and instructors present information in the format that is most comfortable for them, not taking the styles of students into account. Clearly, instructors need to be flexible and accommodate to the needs of students, as this will have a major impact on their learning success. Sensory preference should be taken into account and instructors should provide instructional material in the sensory modality best suited for the student. Thus, the instructor should provide written material to verbal individuals and graphical or imagery data to visual individuals. Ideally, instructors will provide information and material in a variety of sensory modalities that will allow students to not only use their most preferred sensory modality to learn the information, but would also be able to augment their primary modality with information that was processed through other modalities. Instructors need to aware of the holist-analytic style of students and ensure that information is presented and described in a format that allows both sets of individuals to acquire the knowledge. For instance, instructors should not only provide the holistic or total picture of information, but provide a break down of the material and how the separate materials lead to the whole. These are just a few of the many strategies that can be employed to help instructors and instructional materials meet the unique needs of each student. By employing these strategies students of all cognitive styles should have the opportunity to succeed in the distance education environment. In summary, it would appear that the best instructional strategy would be to employ a holistic approach that incorporates many different formats of information presentation through a variety of modalities. By encompassing this vast array of modalities, it is likely that each student will find the opportunity to use his or her most preferred modality to succeed in the course or training experience.

Even though we have focused on the presentation of material to meet the uniqueness of each student, several other variables can have impact on their performance. These include evaluation and feedback to students. It is clear that by being aware of the cognitive/learning style of students, instructors can tailor assessment/evaluation and feedback to match the style of the student. By accomplishing this, students will benefit more from the evaluation and feedback presented. To cover the whole area of cognitive/learning styles that may be present and allow students the opportunity for maximal performance, evaluation should be comprehensive and present assignments and questions in multiple formats to meet the unique style of each student. Failing to accomplish this may leave some students out, even though they may have mastered the material due to evaluation problems and not student related problems. Finally, instructors need to present feedback to students in a manner that best matches their cognitive/learning style. When feedback is unique to the style of the student, it will be well received and processed to a deeper level.

Conclusion

Distance education is becoming a force in the educational realm and appears to be increasing at an astonishing rate as a viable form of education. With this quick to adopt philosophy that appears to sweeping the educational community, many important variables in this new form of education are being overlooked. By focusing on these variables, especially learner characteristics (cognitive/learning styles) we can develop and implement distance education in a format and form that appeals and accomplishes its goal, namely the education of students. Without focusing on these variables, students may be disenchanted with this educational format and feel that they are not getting the education that they deserve, and therefore may seek fulfillment through other methods of education or not seek to advance their knowledge at all.

References

Alport, G. W. (1937). *Personality: A psychological interpretation.* New York: Holt & Co.

Antonietti, A., & Gioletta, M. A. (1995). Individual differences in analogical problem solving. *Personality and Individual Differences*, 18, 611-619.

Ausburn, L. J., & Ausburn, F. B. (1978). Cognitive styles: Some information and implications for instructional design. *Educational Communication and Technology*, 2, 36-44.

Dunn, R. S., & Dunn, K. J. (1979). Learning Styles/teaching styles: Should they…Can they…Be Matched? *Educational Leadership*, 36, 238-244.

Freedman, K. & Liu, M. (1996). The importance of computer experience, learning processes, and communication patterns in multicultural networking. *Educational Technology Research and Development*, 44, 43-59.

Keegan, D. (1986). *The foundations of distance education.* Dover, New Hampshire: Croom Helm.

Messick. S. (Ed.) (1976). *Individuality in learning.* San Fransico: Jossey-Bass.

Smith, R. M. (1984). *Learning how to learn.* Milton Keyes: Open University.

Tennant, M. (1988). *Psychology and adult learning.* London: Routledge.

Witkin, H. A. (1979). Socialization, culture and ecology in the development of group and sex differences in cognitive style. *Human Development*, 22, 358-372.

Using Electronic Portfolios to Support Accountability and Preservice Teacher Preparation

Dr. Gerald W. Burgess
gburgess@asurams.edu
Dr. Barbara D. Holmes
bholmes@asurams.edu

Center for Excellence in Teaching and Learning
Albany State University
504 College Drive
Albany, GA 31705

Abstract: The demand for accountability establishes the framework for educational reform in the new millennium. The portfolio process represents a more authentic form of assessment in that it allows the teacher to judiciously select those work products and artifacts that portray the full range of the teacher's work. In an interactive discussion, participants will identify standards, course competencies, develop rubrics, and determine quality statements that support the evaluation and assessment of the electronic portfolio. The result constitutes not the "how to" develop an electronic portfolio but an understanding of the importance of integrating this strategy into the preparation of teachers who are more proficient in using technology to improve student learning.

Introduction

Amidst demands for increased accountability in education teachers must assert individual and collective perspective about the real work that teachers do. Georgia Governor Roy Barnes declared, "There will be no more excuse-based education in Georgia." This means that teachers will be held accountable for learning outcomes and called to account for the success or failure of schools (Hixson & Tnzmann, 1990). This demand for accountability establishes the framework for educational reform in the new millennium.

Traditional measures of teacher evaluation represent administratively directed events in which the administrator observes and records what he or she thinks the teacher does and makes judgments accordingly. Under the current process, the teacher has no formal way to integrate self-assembled documentation into the formative evaluation process that tells the teacher's story from the teacher's perspective. The current process invites the teacher to react to the evaluation rather than participate meaningfully into the evaluation process. If true accountability is to occur, both the teacher and the evaluator should assess if meaningful instruction and learning have occurred (Bain, 1996).

The portfolio process represents a more authentic form of assessment in that it allows the teacher to judiciously select those work products and artifacts that portray the full range of the teacher's work. The teacher can establish the context of the learning experience through the *Teaching Statement* that describes what the teacher sees as the result of instruction and the philosophy that undergirds the teacher's practice (Lang & Bain, 1997). The teacher is then able to select student work products which demonstrate student understanding of the content taught and the ability to translate this content into a student produced artifact. This process more accurately displays what the student knows and is able to do as a direct result of the teacher's instruction. The portfolio process also provides a way for teachers to capture students learning over a longer period of time and not just during the moment of the supervisor's evaluation visit. Through the portfolio, the teacher can show where the learner began and how the learner progressed through the learning experience. It is this growth process for which the teacher is ultimately responsible for and for which the teacher should be held accountable.

"One of the most difficult and contentious issues we face is accountability. What I want to know is how school systems, schools and personnel can be held accountable for student achievement. And, how can parents, communities and students be held accountable as well?"

Governor Roy Barnes

The Portfolio Process

The production of a portfolio is not new. Many professions, artists, models, photographers and architects are but a few occupations that have successfully implemented the portfolio process. Education has seen the value of this process and is now employing this tool in training programs for preservice and inservice teachers as (1) an evaluation tool to support professional growth and competence and (2) a strategy for accountability for the competencies acquired in the program.

Teacher preparation programs can use to the portfolio process throughout the teacher preparation program by tying specific artifacts to designated courses within the curriculum.

Under the PT3 Program, Albany State University is developing ways for preservice teachers and school leaders to learn using a constructivist and learner-centered model where accomplishments are measured by knowledge and skill based standards imbedded in the activity the learner completes. By incrementally building the technology skill level of students, each learner amasses a technology integration foundation that leads to higher levels of performance. Students can start by constructing an electronic resume formatted in a traditional word processing program then progress to teacher created lessons, which use Internet activities.

The technology skills are increasingly distributed to the point that individual learners acquire the necessary means to participate in the learning process with a wide array of information, resources, and interactivity. As these skills are acquired, learners are able to store this information electronically. Through reflective judgement, the learner can then connect these artifacts to teacher standards and develop an electronic portfolio, which documents professional growth over a specified period of time.

As students learn technology skills, the conventional paper portfolio is being revisited as a means of identifying learner success and the accomplishment of what the preservice teacher knows and is able to do upon completion of established objectives. As administrators, teachers, and learners become more technologically savvy, the traditional portfolio is giving way to electronically produced, computer-generated artifacts reflected in multimedia presentations, web pages, and interactive discussions. As a consequence of these developments, university faculty will need support and professional development to acquire knowledge about integrating and assessing technology-based tools into college classrooms.

In preservice teacher preparation programs, students often do not have time to review the standards that guide the work of the profession. But understanding teaching standards is essential to making a determination of how well one is prepared to teach.

The National Board for Professional Teaching Standards offers five core propositions for effective teaching:

1. Teachers are committed to students and their learning.
2. Teachers know the subjects they teach and how to teach those subjects to students
3. Teachers are responsible for managing and monitoring student learning.
4. Teachers think systematically about their practice and learn from experience.
5. Teachers are members of learning communities.

Throughout the teacher preparation program, electronic portfolios enable students to document (Figure 1):

1. Technology literacy skills.
2. Collegial skills working on group projects.

3. Content mastery in various courses.
4. Reflective assessments of the teacher preparation experience.
5. Experiences in the classroom where instruction is delivered and managed.

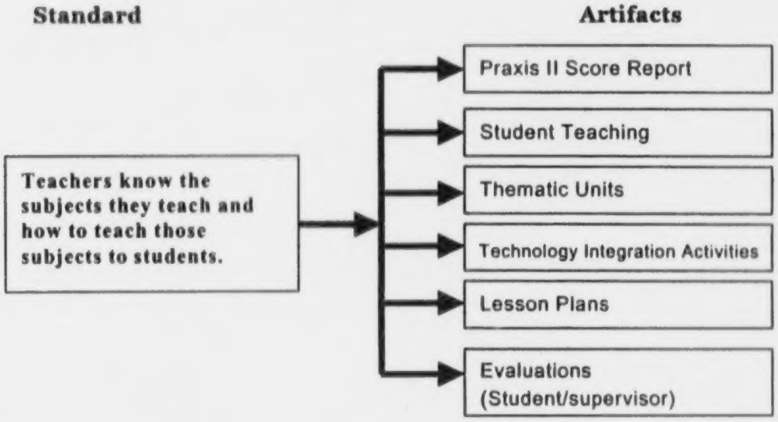

Standard
Artifacts
Teachers know the subjects they teach and how to teach those subjects to students.
Praxis II Score Report
Student Teaching
Thematic Units
Technology Integration Activities
Lesson Plans
Evaluations (Student/supervisor)

Figure 1

As students prepare to develop the electronic portfolio thoughtful consideration should be given to what it is that preparer wants to document. The following questions should be asked.

1. Why am I developing a portfolio?
2. How will I let the viewer know who I am and what I do?
3. What are the specific responsibilities that I perform?
4. What activities were implemented congruent with these responsibilities?
5. What evidence can I provide that proves that these things were done?
6. How well do I think I did?
7. How will I show this self-assessment?

The emphasis need not be on collecting "best work" when creating the portfolio. Instead, a wide range of work samples representative of the work will allow the viewer to examine progress. Working portfolios demonstrate growth over a specified period of time. At the beginning of the portfolio development process, preservice teachers should answer questions such as:

1. What standards guide my work?
2. What evidence do I have to document my effectiveness?
3. What are my strategies for assembling this evidence into a growth history?

Conclusion

As the growth history develops, preservice teachers may include interim evidence and notes on progress. Finally, when the teaching/learning task is completed, preservice teachers need to summarize what went into assisting all learners achieve high levels of learning. Work samples, plans, outlines, final products and even unfinished products might be included in the portfolio. The value then is work accomplished over time that illustrates growth and learning. Such evidence is more meaningful than a one-time snap shot during a single evaluation period. The role of the teacher is changing to include a broader use and application of technology in the classroom. What better way to authenticate a process is there to allow the teacher to judiciously select work products and artifacts that portray the full range of his or her work?

References

Bain, K. R. (1996). Teaching and Learning Issues – Student Ratings and the Evaluation of Teaching: A White Paper, http://president.scfte.nwu.edu/White.htm, Oct 3, 2000

Burgess, G., Holmes, B. (2000). *Producing a Professional Portfolio.* Conway, AR: River Road Press.

Lang, J.M., Bain, K. R. (1997). Recasting the Teaching Portfolio.

Hixson, J., Tinzmann, M.B. (1990) What Changes Are Generating New Needs for Professional Development?, http://www.ncrel.org/sdrs/areas/rpl_esys/profdev.htm, Oct 4, 2000.

Willburn, E. (1996). The Status ofTechnology in Education System: A literature Review. http://www.cln.org/lists/nuggets/EdTech_report.html, Sept. 22, 2000

Distance Education and What is Coming Next?

Kemal Cakici
Department of Management Science
The George Washington University
United States
cakici@gwu.edu

Abstract: In the last decade distance education has gained more importance and attention in its century long history. The more technology and society develops, the greater need for qualified and educated people exist. In order to support this demand for education, schools at all levels started developing and implementing distance education programs. Distance education helps people to work and complete their degrees anywhere while supporting them to become more qualified. As the technology is evolving everyday, the way these programs are delivered change and become more sophisticated. This paper will give a brief history of distance education and try to explain the latest developments in higher education institutions.

Background

Distance education is a rapidly developing approach to instruction throughout the world. This approach has been widely used by businesses, organizations, medical and educational institutions. Especially, academic institutions have been using distance education to reach a more diverse and geographically dispersed audience that is not accessible through traditional classroom instruction.

Traditionally educational systems required in-class instruction by teachers and in-class attendance by students. When distance learning programs started to appear in the early 20th century under the name 'correspondence learning', their major purpose was to serve the population who could not afford to have higher education because of geographical or economical restrictions. In this form, the primary communication mode between an instructor and students was the regular mail and the medium of information delivery was customized printed material. Correspondence learning is the first of three generations of distance learning identified by Moore and Kearsley (Moore, 1996). The second generation began in the early 1970s, with the British Open University. The third generation starts with the advancement of satellite and communications networks in the early 1980s. These networks enabled real time interaction with two way video-conferencing or one-way video and two way audio communications. Multimedia CD-ROM products for self-paced learning and bulletin boards are some of the distance learning tools that emerged in this era.

The distinguishing characteristic of distance education is the physical separation of the instructor and students during the learning process.

As time has changed, distance education concept has changed as well. With the use of Internet technology, the era of the old text based and slow data exchange has evolved into fast high-speed fiber optics Internet bandwidth which allows seamless interaction between the instructors and the students from anywhere in the World. It took almost a century for distance education to gain grounds from the first approaches of correspondence study to today's Web-based technologies.

Today

With the initial developments in the Web technology, there was a concern that the old transmission model of one-way instructional delivery was going to be repeated that ignored the importance of students' interaction and left the students autonomous and isolated. Instructors initially used the objectivist (teacher-centered) approach to learning where they used Web as a mere information-delivery medium to post online syllabi, assignments and lecture notes. However, with the use of Internet technology, more interaction-based applications started to dominate the distance education such as discussion and chat rooms, whiteboards, collaborative tools and video streaming. As a result of these developments, students are having more "closer" interaction and experience than a traditional classroom. The current question is not, whether there is a physical distance between the students and the instructor. It is whether, the real 'learning space' among students and the instructor is closer or not.

Internet and the World Wide Web is the main reason for the paradigm shift from the objectivist (teacher-centered) approach of learning to constructivist (learner-centered) approach of learning. In the latter approach, students learn at their own pace and convenience. A student can now be more in charge of what, when, and where he learns. Along the line, higher education institutions will no longer be the center of power and control of dispensing information and knowledge, but service according to the students' needs for guidance and leadership.

What else can be done?

Bottleneck, bandwidth and protocol limitations on the current Internet backbone is limiting the possibilities to introduce new tools that will enhance the capabilities of distance education. "The amount of Internet content and users has grown exponentially since the early 1990s creation of the World Wide Web. But Internet hardly kept pace"(Fngerman, 1999). In October 1996, Internet2 (I2) consortium was formed by thirty-four universities to enhance the present Internet with new software applications and hardware technologies. The motivational factor behind the formation of this new consortium was to have an extremely high-bandwidth test-bed for academic research and teaching. The possibilities on this new Internet, which will not be clogged by commercial users, are beyond imagination. "Think of the entire contents of the Library of Congress transmitted in seconds. Think of three-D brain imaging transported with clear and instantaneous resolution to surgeons around the world on a particularly difficult case. Think of geographically separated engineers working together in real-time on intricate models and structures" (Fngerman, 1999). "More than a faster Web or e-mail, these new technologies will enable completely new applications such as digital libraries, virtual laboratories, distance-independent learning and tele-immersion" (Internet2 Consortium,)

I envision broader developments such as multi-point, one-to-many, many-to-one video-conferencing. Think of an instructor, sitting in his home-office and interacting with multiple students face-to-face around the world at the same time without compromising the content of the material being taught. In another scenario, a student will be able to feel and smell by using virtual reality technology just as one experience the thrill of flying by using a joystick. There will be virtual laboratories for chemistry, biology, physics and medical students where they can experiment on anything without even leaving their dorms while being guided and supervised by experts in their corresponding fields. The next radical technological development in the distance education will be the 'wearable computers'. Having a computer that you can wear and be able to access the educational material without the physical boundaries of the computer networks will bring real 'real-time' learning. For anything beyond these ideas, we will have to wait and see how technology evolves in the 21st century.

As technology develops, the delivery methods will develop as well. Therefore, now the questions are: What is next and how and when?

References

Fngerman, S. (1999) Internet2 and Next Generation Internet: Two for the Future [Web Page]. URL http://www.findarticles.com/cf_0/m0FWE/11_3/57785870/print.jhtml.

Internet2 Consortium. (Frequently Asked Questions [Web Page]. URL http://www.internet2.edu/html/faqs.html.

Moore, M. G. and Kearsley. G. (1996). Distance Education: A Systems View. Belmont, California: Wadsworth Publishing Company.

The Challenges of Interfacing Between Face-To-Face and Online Instruction

Nada Dabbagh, George Mason Univ., USA

Abstract: The use of the Web for instructional purposes at higher education institutions has crossed the spectrum of distance education delivery contexts, ranging from the Web being used to supplement face-to-face instruction to a primary delivery mechanism for instruction. This article discusses the migration from face-to-face classroom instruction to Web-Based Instruction (WBI) through the experience of a faculty member in the creation and teaching of Web-based courses at a higher education institution. Specifically, four areas which represent challenges for faculty will be discussed: issues surrounding course content; technological assumptions; logistical and implementation challenges; and interfacing between face-to-face and online learning environments. Guidelines for effectively integrating components of a WBI system to support the teaching and learning process in each of these areas will be provided.

Introduction

Interest in the development and use of Web-Based Instruction (WBI) in higher education has seen an explosive surge of activity. In a recent survey by the U.S. Department of Education's National Center for Educational Statistics (NCES), it was reported that the number of distance education programs increased by 72 percent from 1994-95 to 1997-98 and that an additional 20 percent of the institutions surveyed plan to establish distance education programs within the next three years (The Institute for Higher Education, April 2000). It was also reported that 1.6 million students were enrolled in distance education courses in 1997-98. A search for "Web-based courses" using Alta Vista in late 1999 resulted in more than 16 million hits, with results ranging from actual courses being offered on-line, courses enhanced with Web-based resources, and sites discussing the issues surrounding WBI. The results also revealed that the Web is being used for learning purposes in a variety of areas, including business, K-12 and higher education.

Increasingly, institutions and faculty members are feeling pressure to offer Web-based courses to meet economic and student demands. Companies like Real Education (now eCollege.com), WebCt and Blackboard have created environments to make the development of WBI easier for higher education. Despite the advertised ease of creating WBI using "Web course in a box" applications, faculty members and instructional designers working to meet this demand are discovering that the creation of WBI comes at a considerable price in terms of time, effort and resources. While there may be several reasons why the cost of creating WBI is so high, one driving factor appears to be a lack of guidance in "best practices" for creating these types of learning environments. The literature base is beginning to develop (see, for example, Khan, 1997); however, to date, there are not many resources that offer assistance in terms of guidelines for creating WBI on a course by course level. Many faculty are engaged in transforming their current traditional classroom-based courses using a "Web Course in a box" application to a Web-based format ending with a little more than another "version" of the same course. This may be very convenient for students who wish to access course materials at any time, any place, however the effort expended by these faculty is not realized due to the absence of guidelines that could help this transformation process become more effective and efficient.

Web-Based Instruction

Distance education delivery contexts range from Web-supported or Web-enhanced instruction, known as the *adjunct mode*, to the administration of distance learning courses, known as the *online mode*. In the adjunct mode, WBI can work hand-in-hand with traditional classroom instruction where classes would meet 15 times during a semester and the Web-based component is an add-on to support classroom instruction. This facilitates the organization of course materials by the instructor, provides continuous student access to these materials, facilitates student-student and student-instructor communication, and offers students a richer and more self-directed learning experience. WBI can also replace a significant portion of face-to-face instruction. This would be known as the *mixed mode* with the networking fully integrated into the curriculum and up to one half of the course conducted online. The totally *online mode* is where the network serves as the primary environment for course discussions, assignments, and interactions even though media such as textbooks, telephones, or face-to-face meetings may be incorporated as part of the overall instructional design of the course.

"Web Course in a box" applications like WebCt, Blackboard, Virtual-U, Learning Space, and many others, can be used to create any of the distance education delivery contexts discussed above due to their comprehensive nature of providing instructor tools, learner tools, technical tools and administrative tools (Dabbagh, Bannan-Ritland, & Silc, 2000) needed to ensure appropriate creation and delivery of WBI. Moreover these applications are integrational in nature in that they incorporate hypertext, hypermedia, graphics, animation, digital video and audio, self-contained interactive modules, and asynchronous and synchronous tools (Bannan-Ritland, Dabbagh, Harvey, & Milheim, 2000) which are features and components of WBI (Khan, 1997). The comprehensiveness and integrational nature of these applications however present many challenges for faculty which can be categorized into four major areas:

- issues surrounding course content;
- technological assumptions;
- logistical and implementation challenges; and
- interfacing between face-to-face and online learning environments.

In the sections that follow I will present guidelines for effectively integrating components of a WBI system to support the teaching and learning process in each of the areas listed above. The focus will be on utilizing a Web-based course management tool to support face-to-face instruction and on the ensuing challenges of interfacing between these two teaching and learning environments.

Using a Web-based course management tool to support face-to-face instruction

A Web-based course management tool is an enabling tool that supports WBI in any of its delivery modes (adjunct, mixed and online). For the sake of this discussion, WebCt has been selected as an example of such a tool. Although some Web-based course management tools may offer different features than others, the majority of these tools have similar standard features making it possible for the reader to apply what is articulated in this discussion to any Web-based course management tool.

WebCt facilitates the organization of course material on the Web and provides a variety of tools and features that can be added to a course. Examples include a conferencing system, on-line chat, student progress tracking, group project organization, student self-evaluation, grade maintenance and distribution, access control, navigation tools, auto-marked quizzes, electronic mail, automatic index generation, course calendar, student homepages, student work areas for posting content, course content searches and more. Hence the comprehensiveness of the tool. Use of these features can promote collaborative learning, enhance critical thinking skills through content generation, representation and synthesis and give every student an equal opportunity to express their views and test their ideas through online discourse and other Web-based instructional activities (Dabbagh, Bannan-Ritland, & Silc, in press 2000).

Issues surrounding course content

Of particular interest in this discussion is the effective use of Web-based features enabling the organization of course content. According to Hedberg and Harper (1998) the visual metaphors employed by Web-authoring tools restrict the learning environment by placing constraints on the organization of content and the learning strategies. WebCt is no different. Faculty using WebCt for the first time tend to follow the structure imposed by the interface which models a linear path of organizing course content. The interface mimicks the organization of a syllabus by providing a template for course information, course content, course resources and a calendar for a timeline. Course content can be organized linearly using a *course path tool*. Utilizing this tool results in a page-turner format where students can begin in one place and move forward or backward along the path from one document to another. In this case, the content is usually instructor generated and generally stable leaving learners little or no input in the organization or generation of the course content (see figure 1.1).

Insert figure 1.1 here

This method of organizing content works well if the instructor's pedagogy is didactic (instructivist), requiring students to read resources in a certain order and preventing students from getting lost in the process. In an instructivist pedagogy, resources are generated by the instructor and organized in a linear order from the instructor's point of view and every student receives the same instruction at the same pace using the same context (Dabbagh, 96). Once a faculty member becomes more familiar with the tool's features, other approaches to organizing content and resources become evident. For example the feature of 'adding a single html page' in WebCt provides the instructor with the ability to annotate resources and contextualize content based on related class activities. In utilizing this feature, the instructor has the option of using a Web-based editor to create, organize, and describe course content and resources and then upload this page(s) to the course homepage or to any other page of the existing WebCt interface. This alternative method of content organization and structure provides students with a greater degree of flexibility in selecting and using resources however the generation and organization of content is still largely an instructor's task (see figure 1.2).

insert figure 1.2 here

The shift to a more constructivist design of content in WBI occurs when students are given multiple opportunities to generate their own resources and are provided with tools to synthesize, organize, and restructure course content (Bannan & Milheim, 1997). This calls for a more learner-centered environment where the instructor requires students to search for relevant resources and upload them to a student 'posting area'. Students can work individually, in pairs, or in small groups on an assignment or a class activity and the resulting information synthesis can be uploaded to an 'individual work area' or a 'group work area' using the WebCt interface. In this situation, learner-generated resources can be characterized as reusable (e.g. in another course or in the same course for a different activity), more contextual than instructor-generated resources (students know where to find them and why they're there), and as enabling a dynamic rather than static structure to content. Figure 1.3 demonstrates resources generated by students who were working in pairs to complete an assignment about comparing and contrasting objectivist and constructivist learning environments. The resources were posted by the students in their designated work areas and later reorganized by the instructor to serve as samples for a future class.

Insert figure 1.3 here

Figure 1.4 is a result of several class activities in which students worked in small groups to generate characteristics of constructivist learning environments (CLEs) for the several models discussed in this class. The resulting information was uploaded to the student posting area and later synthesized by the instructor to form a resource for future class discussions and to serve as evaluation criteria for students' final projects.

Insert figure 1.4 here

The discussion above demonstrates how different features of a Web-based course management tool can be used to generate and organize course content and resources in conjunction with an instructor's pedagogy. Shifting from a didactic to a facilitator role, an instructor can utilize different features of a tool to vary the attributes of instructional strategies and activities from supplantive to generative, allowing students to contribute their own resources and content and structuring and reorganizing content so that it is contextualized and reusable. Figure 1.5 illustrates how an instructor's pedagogy influences instructional strategies, activities and resource generation.

Insert figure 1.5 here

Technological Assumptions

Another important aspect of using a Web-based course management tool to support face-to-face instruction is the technological expectations presumed by the instructor. For example, using threaded discussions can be a difficult concept for students to understand and often instructors or online discussion facilitators assume that if students are familiar with email then using threaded discussions is a natural extension of this skill. In the absence of proper instructional support and practice, posting to threaded discussions can be a daunting task for many. Here is what one student had to say about this issue:

> "The process of threading took some teaching time, how to respond to particular messages without creating new strands in the discussion. Navigating through a threaded discussion is also very difficult. Additionally, we are required to post files in another section, and there is some difficulty in accomplishing that."

WebCt has a main forum area which can be used as a practicing ground for first time users of threaded discussions. Instructors can post a greeting to the class containing a brief social bio and then ask students to do the same. This initiates a discussion in an environment which is non-judgmental and where no grade is associated. The instructor can model a moderator's role and provide an ice-breaker for future discussions in which postings are related to the readings and students are required to provide a studied rationale for their statements and positions.

WebCt can also pose a threat to students when it comes to uploading files and resources to the individual or group 'posting area'. There are several steps involved and the procedure is not intuitive. Students who are technologically skilled usually have little problem and are able to help other students with uploading procedures however others may struggle endlessly. These technological issues can interfere with the learning process causing frustration both for the students and the instructor. Adequate class time and instructional support should be provided for bringing students up to speed with the uploading procedure for any Web-based course management tool in order to minimize such problems.

Logistical and Implementation Issues

Another challenge facing faculty who have committed to the use of Web-enhanced instruction is administrative support for logistical and implementation issues. Many universities have initiated centers to support faculty in utilizing innovative technologies in teaching and learning and the efficacy of these centers is instrumental to the success of such endeavors. Administrative support centers for innovative technologies must keep abreast of faculty needs and provide instructional support through workshops, online tutorials and help guides. Most integrated course management systems like WebCt have extensive resources (some built into the tool itself) to support first time users however faculty are often reluctant to rely on this type of guidance as it does not take into consideration the existing course format and pedagogy which faculty have been using in a traditional classroom format. Instead, faculty find themselves spending double the time and effort in reorganizing their course materials to fit the new delivery medium losing focus of the big picture. The transformation from face-to-face to online requires what Collis (1997) refers to as *pedagogical reengineering*. This is where support centers can help. Support centers should be staffed with instructional designers who are skilled in identifying the teaching needs of faculty to help them integrate Web-based technologies as effectively as possible. The Institute for Higher Education Policy in its report on the quality of online learning listed the following elements under what it calls 'faculty support benchmarks' (April 2000, p.3):

- technical assistance in course development should be available to faculty;
- faculty members should be assisted in the transition from classroom teaching to online instruction and are assessed during the process;
- instructor training and assistance, including peer mentoring, should continue through the progression of the online course;
- faculty members should be provided with written resources to deal with issues arising from student use of electronically-accessed data.

Following the above guidelines will certainly diminish the logistical and implementation challenges associated with using a Web-based course management tool to support face-to-face instruction.

Interfacing between face-to-face and online learning environments

By far the most challenging issue facing faculty who are using a WBI component to support f2f instruction is the ability to effectively interface between the two delivery formats. According to Palloff & Pratt (1999), preparation time for f2f instruction requires between 6.5-7.5 hrs/wk while preparation for online instruction requires 18-19 hrs/wk. Just looking at this statistic one can imagine the time and effort required to prepare for both delivery formats which in essence is what a faculty member is doing when supporting f2f with a WBI component. In many instances faculty have handed print-based syllabi and assignments in class and then also uploaded these documents to the Web for students' convenience and ease of accessibility. If one is not careful, the experience can be almost like conducting a whole other course! The trick is to learn how to create activities that integrate both formats rather than creating activities for each which could result in ineffective redundancies. For example, one activity can require students to engage in a classroom discussion on course readings and then synthesize the key points of the discussion (individually or in groups) and post the synthesis on the Web in the student posting area for others to download and for the instructor to evaluate. Alternatively, an online discussion can be facilitated using the asynchronous discussion tool in WebCt and the synthesis can be presented in class. Another example of an instructional activity that integrates both delivery formats is requiring students to post drafts of a class paper online and then engage in a peer feedback exercise in class. The instructor can randomly arrange students' papers in pairs on the Web (an easy task in WebCt) and provide an evaluation rubric that students can download and use to prepare their feedback. Students can then communicate their evaluation to their partner in class making the process more effective and efficient by taking advantage of both mediums. A third example of creating activities that integrate both mediums is to provide Web-based group discussion forums when group work and group presentations are an integral part of the course. This saves student time in arranging meetings outside of class and gives the instructor more f2f class time to give lectures if needed. Groups can discuss their work in these forums independently, share documents and resources, and prepare for their class presentation. At the same time, groups can get feedback from the instructor through these forums and more importantly, the instructor can monitor the group process and group dynamics.

Another challenge facing faculty and students who are interfacing between f2f and WBI is time management skills. As one student put it:

> "Compared to a traditional f2f classroom environment where one attends a 3 hour class, goes home and has a week to prepare for the next class, WebCt forces you to logon daily to check on things and participate in ongoing online discussions. You end up putting much more time in-between classes."

Though not necessarily a negative comment, adequate time should be provided for students to get accustomed to the added WBI component. Faculty often do not take this issue into consideration and students may become frustrated in having to deal with attending class and contributing to online activities if they don't employ effective time management skills. Another student's perspective indicates that interfacing may save time in the long run:

> "Using WebCt does save time in the long run in the classroom in that everyone has a chance to put forth his/her point of view. In the traditional classroom we always seem to run out of time for discussing topics. I also think it saves time in that it gives students more time to process, question, and get feedback as opposed to just being in a classroom setting."

Conclusion

It is a delicate balance to create activities that integrate both mediums, employ effective time management skills and guard against doubling the work both for students and faculty when using a Web-based course management tool to supplement face-to-face instruction. If appropriate guidelines are applied however, the advantages of interfacing between f2f and online instruction, known as the adjunct mode include the following:

- Providing the ability for the instructor to capture class activities and archive process and product enabling access to content beyond the timeframe of the course;
- Providing the opportunity for ALL students to contribute (wider opportunity to communicate and participate);
- Allowing students to articulate reflections on content and course issues at any time through the main discussion forum area (readily accessible, time independent);
- Engaging students more dynamically in thinking about the course content by logging on to explore resources and follow discussions (just-in-time resources);
- Facilitating modeling and scaffolding more efficiently using previous student samples and expert intervention;
- Facilitating peer feedback and collaboration on group projects;
- Promoting distributed learning (multiple perspectives, multiple expertise).

Guidelines for utilizing a Web-based course management tool to support f2f instruction

The above discussion suggests the following general guidelines to be taken into consideration when utilizing a Web-based course management tool to support f2f instruction. Some of these guidelines apply for both the instructor and the students:

- Integrating not duplicating: when planning instructional/learning activities, careful consideration must be given to insure that these activities are integrating both formats and not duplicated in each.
- Don't underestimate the learning curve: using a Web-based course management tool is a new learning experience for both faculty and students. Plan for and provide adequate instruction on how to use the Web-based tool (for yourself and the students).
- Finding the right balance: interfacing between f2f and online instruction requires knowledge of time management skills. Make sure that you and your students are aware of this aspect and provide some guidelines on how to make this process effective and efficient. An example of such guidelines would

be to give students an estimate of how much online time is required on a daily basis to participate in associated activities.

- Avoid conducting a whole other course: supporting f2f instruction with a Web-based component can easily double the work for an instructor if one is not careful. It can also increase the time spent outside the classroom for students. It is important to keep in mind that the Web-based component is intended to 'support' the course and facilitate the delivery of content and the implementation of existing activities.

References

Bannan-Ritland, B., Dabbagh, N., Harvey, D. & Milheim, W. (February, 2000). *Evolution of Web-based instruction: Connecting Technical Attributes to Conceptual Bases.* Paper presented at the Association for Educational Communications and Technology, February 2000, Long Beach, California.

Bannan, B. & Milheim, W. (1997). *Existing Web-Based Instruction Courses and Their Design.* In B. H. Khan (Ed.), Web-Based Instruction. Englewood Cliffs, NJ: Educational Technology Publications.

Collis, B. (1997). *Pedagogical Reengineering: A Pedagogical Approach to Course Enrichment and Redesign With the WWW.* Educational Technology Review, Autumn/Winter 1997, n. 8.

Dabbagh, N., Bannan-Ritland, B., & Silc, K. (in press, 2000). *Pedagogy and Web-Based Course Authoring Tools: Issues and Implications.* In B. H. Khan (Ed.), Web-Based Training. Englewood Cliffs, NJ: Educational Technology Publications.

Dabbagh, N. (1996). *The Effect of Contextualizing Instruction of quantitative Subject Matter in Large Introductory Classes to Students' Most-Preferred and Personally-Relevant Interests on Knowledge Acquisition and Relevance.* Dissertation Abstracts.

Hedberg, J. & Harper, B. (March, 1998). Visual Metaphors and Authoring. [WWW document]. URL http://itech1.coe.uga.edu/itforum/paper25/paper25.html

Khan, B. (1997). *Web-Based Instruction.* Englewood Cliffs, NJ: Educational Technology Publications.

Khan, B. (1997). *Web-Based Instruction (WBI): What Is It and Why Is It?* In B. H. Khan (Ed.), Web-Based Instruction. Englewood Cliffs, NJ: Educational Technology Publications.

Palloff, R.M. & Pratt, K. (1999). *Building Learning Communities in Cyberspace: Effective Strategies for the Online Classroom.* Jossey-Bass Publishers: San Francisco.

The Institute for Higher Education Policy, (April 2000). Quality On the Line: Benchmarks for Success in Internet-Based Distance Education. Washington, DC.

Establishing a New Paradigm for On-line Education

Anthony R. Davidson, Ph.D.
Director of Graduate Programs
Information Technologies Institute, SCPS, New York University, New York, USA
anthony.davidson@nyu.edu

Anne Stanton
Associate Director
Information Technologies Institute, SCPS, New York University, New York, USA
annie.stanton@nyu.edu

Steve Albanese
Program Coordinator
Information Technologies Institute, SCPS, New York University, New York, USA
steve.albanese@nyu.edu

ABSTRACT The steady evolution of communications technology (radio, television, interactive video, audio-graphics, electronic mail, Internet, intranet) has considerably influenced the development of distance learning. This third generation of distance education, which includes interactive video, email, Internet, intranet, and audio graphics technologies, learning activities via these distance education systems has been redefined to include and focus on teacher-student interaction. This paper examines technology, student lifestyles, faculty characteristics and continuity, quality and quantity of courses, quality and quantity of students, and interactivity as the primary ingredients of a successful and effective on-line education program. In particular, the program at the Information Technologies Institute in the School of Continuing and Professional Studies at New York University, an asynchronous education programs, is demonstrated and evaluated. Instructional design principles and novel authoring concepts are introduced to the online course environment.

Introduction

The term, distance education, is not a new term, however, in recent years it has taken on new meaning. In the past, distance education was known as correspondence courses that were used to meet the needs of rural areas. The first and second generation of distance education delivery systems was designed primarily to produce and distribute learning materials as efficiently as the technology of the day permitted without any attention to interactive communication between students and teacher. Today's third generation of distance education, immediately conjures up the notion of teaching that takes place over the Internet and that is facilitated through the use of Web-Based Instruction (WBI).

In the current business climate emphasizing total quality management, it is crucial to analyze the critical factors that will help meet and exceed customer expectations. In an effort to build the foundation for a new paradigm in delivering cutting-edge distance education, the paper discusses what has been learned regarding teaching and studying through this technological medium and also identifies some of the problems encountered. It seeks to address those difficulties and incorporates design features that the research finds to be most useful for both teachers and students. Much of the information is derived from the largely successful on-line education program at the Information Technologies Institute in the School of Continuing & Professional Studies at New York University.

Evolution of the Program

SCPS's Information Technologies Institute began in 1968 under the name of the "Data Processing and Systems Analysis Institute" and offered mainly a mainframe computing and data processing curriculum for the first fifteen years. The department name was changed in 1984 to accurately reflect the interrelationships between computer and communications technologies. In Fall, 1990 the Institute offered 17 certificate programs, a 16-credit undergraduate diploma program in Computer Technology, and introduced a brand new on-site 16-credit graduate Advance Professional Certificate in Information Systems Auditing; the Institute enrolled 5,101 students during the 1990/91 academic year. Almost all of these students worked in Manhattan and lived within a 40-mile radius of the campus.

Fall, 2000 finds the Institute offering 25 certificate programs, a 16-credit graduate Advanced Professional Certificate in Information Technologies, an M.S. in Management and Systems, and the concentration curriculum support for McGhee's Bachelors in Communications Technology. The 1999/2000 academic year has not been actualized, but final calculations indicate that total enrollments will clear 6,000 students. The growth in enrollments can be largely attributed to online enrollments [non-credit and graduate]; for example, this past summer, 2000 term, there were 2025 enrollments of which 501 (24%) were students enrolled online.

Online Programs Facts & Figures

The Information Technologies Institute non-credit online initiative began in Fall 1999, and has consistently expanded over its three semesters.

Semester	# Classes Offered	Total Enrollment
Fall 99	14	176
Spring 00	18	350
Summer 00	16	374
Fall 00	24 (4 new courses)	478
Spring 01	38 (13 new courses)	673

The Graduate Programs, which consist of an MS and an Advanced Professional Certificate, have grown at an equally dramatic rate and the number of new enrollments constantly exceeds forecasts. In fact, since the 336 points enrollment of the 1994/1995 academic year the program has experienced a 400% increase. The online retention rate is an outstanding 98%, which is well above the national average of 60%.
The program boasts a geographically dispersed student body with representatives from Washington DC and 25 different states ranging across America, in addition to internationally based students from Puerto Rico, Canada, Argentina, England, Korea, Thailand, Japan, Spain and Italy. The 30-39 year old range is the predominant age group and there are more males than females, especially in the Master's Program.

Critical Success Factors

The success of the respective programs lies in the commitment to dedicated faculty, finely tuned admissions criteria, industry-driven courses, peer to peer learning, teamwork, faculty development and a meticulous auditing process that monitors both course content and student interaction.

Faculty

Faculty is carefully selected with particular attention paid to the instructor's professional background in addition to teaching ability. It is expected that each faculty member is able to draw on a wealth of industry-related experiences that can enhance the course material and embellish the students' learning process. Since a vast majority of the students are working professionals enjoying advanced positions in their respective organizations, it is crucial that the instructor is able to command respect and capture the students' attention early in the course in order to provide an effective learning experience. This is far more easily accomplished by recruiting faculty members who are proven performers in industry.

It is often the case that professional success and effective communication skills are not sufficient to ensure academic quality. In order to promote the academic excellence of the programs faculty attend workshops led by a Clinical Professor with over 15 years experience in graduate programs at major universities. The workshops are designed to help the instructors refine course content, improve delivery methods and infuse the material with a rigorous academic component. Since many of the faculty members will be involved in student advisement and/or supervision of the required thesis for the MS degree, the workshops also serve as an opportunity to introduce and develop the required skills and academic standards that must accompany the production of an advanced research paper. In addition, the Clinical Professor will work with faculty members on a one-to-one basis in the area of course development.

Students

The admissions criteria are GMAT (or equivalent) scores, undergraduate degree, professional experience and a personal statement. It has been found that no single criterion can determine whether a student will be successful or not but the most significant predictor is the personal statement. While each student must have performed well on the undergraduate level, at their job and in the graduate test, it is the personal statement that will most likely indicate their propensity for success in the program. It is the Institute's policy to seek well-educated, highly motivated self-starters who are eager to learn and can demonstrate the ability to handle the workload of an intense learning experience. The admissions committee has done an excellent job of filtering a staggering increase in applications so that the increased number of admissions has not compromised the 98% retention rate that the Institute boasts.

Course Content and Delivery

In addition to offering a wide array of new and exciting courses that are industry-driven, student learning and interest is piqued by a number of factors. The courses are delivered in an asynchronous manner over the Internet with a heavy emphasis placed on peer to peer learning and teamwork. The Learning Space is comprised of four major areas: schedule, media center, course room and profiles. The bulk of the course takes place in the course room where there are vibrant, threaded discussions groups taking place on a constant basis. Students check in on at least a daily basis and often several times a day to read and comment on the instructor and student contributions. In order to enhance the experience the media center is used for the instructors and students to post files that may contain links to pertinent web sites, or documents containing current articles, audio, video, graphics and multimedia. The relative anonymity of the course room motivates many students to voice their opinion. This is a substantial advantage over a traditional classroom in which students may be too shy and potentially enthralling class discussions simply break down.

Despite this anonymity students still develop a strong sense of collegiality. In the Profiles section, students are able to enter as much (or as little) information about themselves and their personal and professional lives as they wish. Many students even avail themselves of the opportunity to post a photograph. In the discussions, students are encouraged to relate their work experiences as they pertain to the issue at hand. As a result, students form a sense of camaraderie as they share similar occurrences. Coupled with the strong bond necessitated through extensive and complex team projects the students have ultimately formed many relationships outside the confines of the course. This is especially nurturing to the education process as the students progress through various classes together wherein they will often request to be on the same team. As mentioned previously, team learning is especially valuable and the Institute maintains a database that enables the auditors to help faculty build teams should the students not form ones on their own.

Auditing

The key to successful student participation, learning and the high retention rate has been the vigilant auditing policy in which the Institute engages. Students and faculty are expected to be online every day. Experienced academics monitor the faculty contributions to make sure that the faculty lectures and summaries are posted on a timely basis, that the content is consistent with the course description and objectives and that the instructor provides regular feedback to the students. There is also a group of internal course auditors who will contact students if they have been offline for more than 48 hours. Sometimes this could be due to a technical problem, in which case the technical staff is notified and troubleshooting takes place. Other times this could be due to personal problems or difficulty with the workload. In each case the problem is documented and the faculty member will contact the student via phone or email to try and resolve the issue. The Institute believes in a very strong and personal mentoring process to aid students through a rigorous program.

Troubleshooting

As with all technology there are times when the courses might experience technical difficulties. In an effort to provide rapid identification and response, the Institute employs technical aides who monitor the course for potential trouble spots. Sometimes, problems might be reported to the help desk by a student, in many cases the student posts an advisory in the course room. In addition to its own Technical Director who is responsible for maintaining rapid identification and resolution of technical problems, the Institute outsources to a dedicated help desk that works with vendors, faculty, technical aides and department on solving technical difficulties. The organization also provides one-on one training sessions for new instructors and will assist faculty with configuring their laptops.

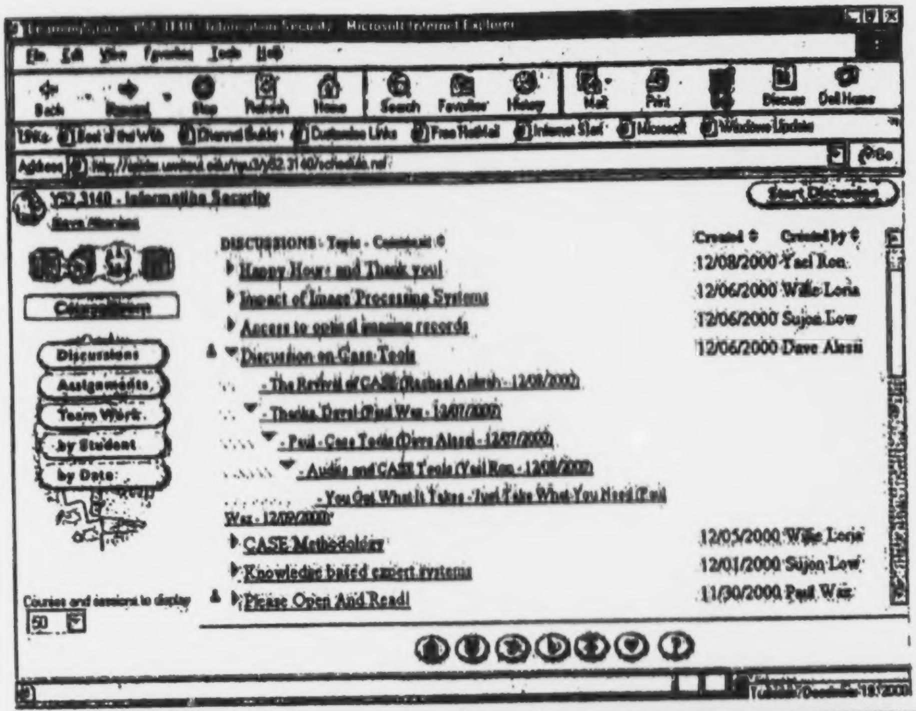
Conclusion and Summary

This paper has introduced some of the key issues that are necessary for the development and maintenance of a successful online educational program. The Information Technologies Institute in the School of Continuing and Professional Studies at New York University has evolved into a premier deliverer of superlative, stimulating and academically challenging online education at the Masters, Certificate and Non-credit levels. In addition to having industry-driven courses and faculty the Institute has identified its ability to develop a finely tuned admissions strategy as one of the main reasons for its astounding 98% retention rate. Other critical success factors are:

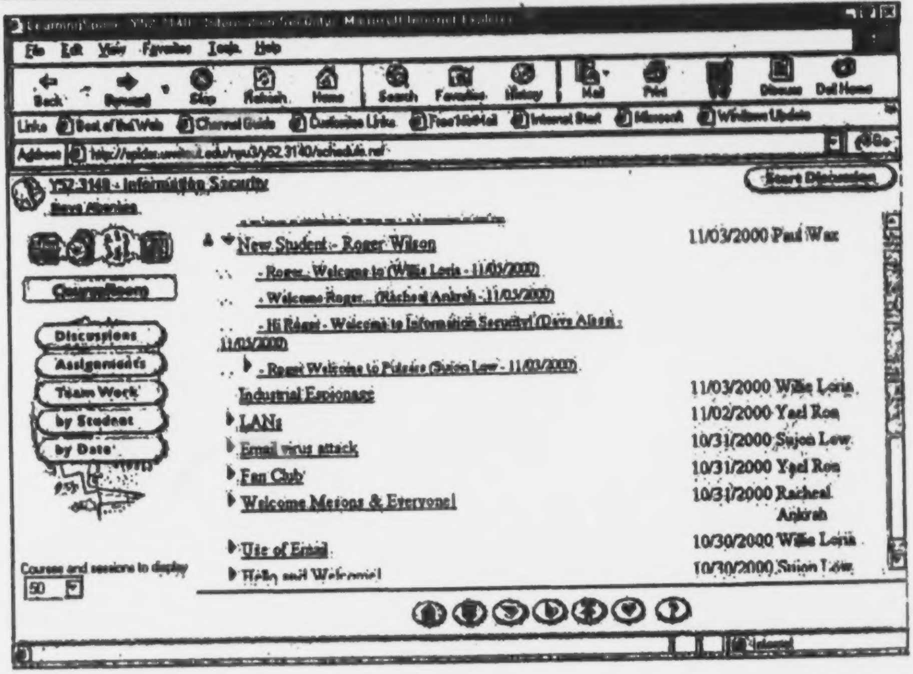
- Emphasis on team-based work -- the peer-to-peer learning that is fostered and cultivated online
- The equalizing force of the medium that promotes student to student learning
- Internal course auditors that contact students when they have been offline for more than 48 hours
- A database that enables auditors to help faculty build teams
- Extensive faculty training and development technically and academically
- Supervision of course content and academic integrity

Screen Shots

Included in the next two pages are some screen shots illustrating a typical interface that someone in the online course might encounter in the course room. On any given day there may be as many as 150 postings from a 20 student class in a course. The postings will range from comments on other contributions, to teamwork observations to new discussions to questions for the Professor or colleagues in the field.

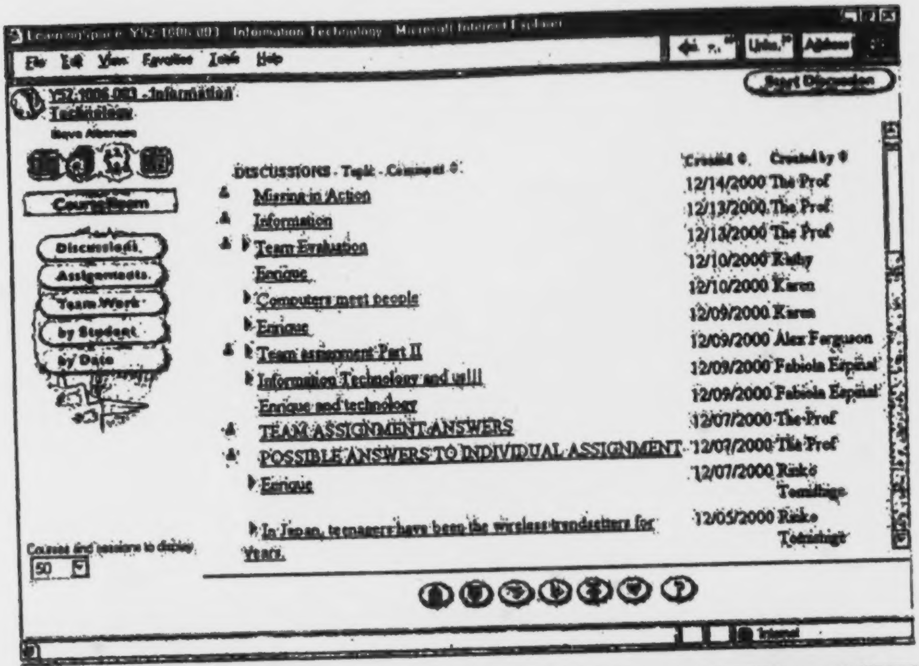

Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print Discuss Dell Home
Links Best of the Web Channel Guide Customize Links Free HotMail Internet Start Microsoft Windows Update
Address
Go
Y52.3140 - Information Security
Start Discussion
CourseRoom
Discussions
Assignments
Team Work
by Student
by Date
Courses and sessions to display
50

DISCUSSIONS - Topic - Comment	Created	Created by
Happy Hour - and Thank you!	12/08/2000	Yael Ron
Impact of Image Processing Systems	12/06/2000	Willie Loria
Access to optical imaging records	12/06/2000	Sujon Low
Discussion on Case Tools	12/06/2000	Dave Alessi
- The Revival of CASE (Racheal Ankrah - 12/08/2000)		
- Thanks Dave! (Paul Wax - 12/07/2000)		
- Paul - Case Tools (Dave Alessi - 12/07/2000)		
- Audits and CASE Tools (Yael Ron - 12/08/2000)		
- You Get What It Takes - Just Take What You Need (Paul Wax - 12/09/2000)		
CASE Methodology	12/05/2000	Willie Loria
Knowledge based expert systems	12/01/2000	Sujon Low
Please Open And Read!	11/30/2000	Paul Wax

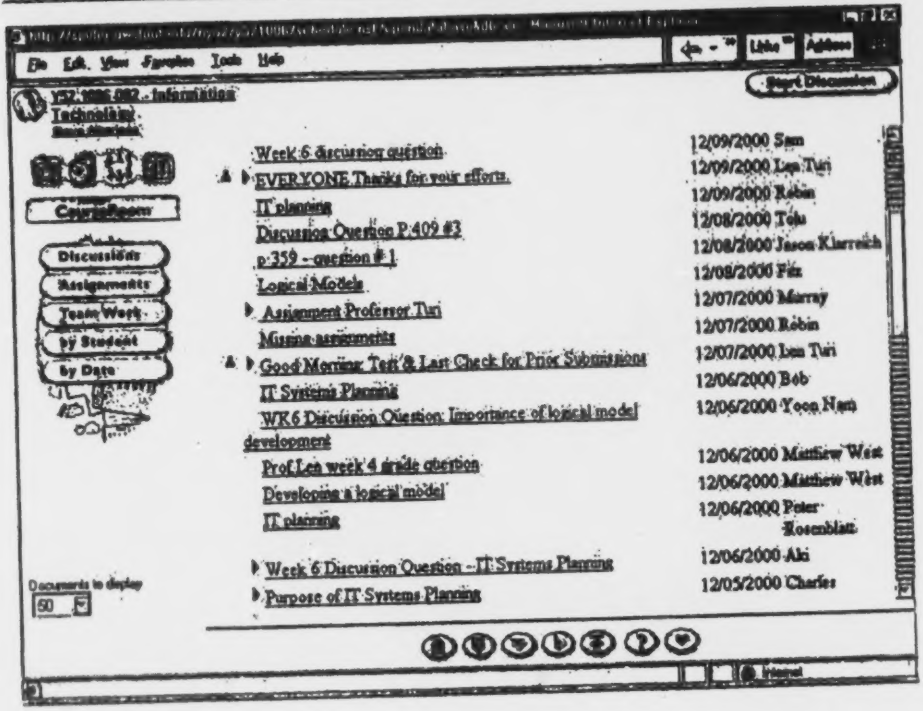

Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print Discuss Dell Home
Links Best of the Web Channel Guide Customize Links Free HotMail Internet Start Microsoft Windows Update
Address
Go
Y52.3140 - Information Security
Start Discussion
CourseRoom
Discussions
Assignments
Team Work
by Student
by Date
Courses and sessions to display
50
Internet

New Student - Roger Wilson	11/03/2000	Paul Wax
- Roger - Welcome to (Willie Loria - 11/03/2000)		
- Welcome Roger... (Racheal Ankrah - 11/03/2000)		
- Hi Roger - Welcome to Information Security! (Dave Alessi - 11/03/2000)		
- Roger Welcome to Pidgeis (Sujon Low - 11/03/2000)		
Industrial Espionage	11/03/2000	Willie Loria
LANs	11/02/2000	Yael Ron
Email virus attack	10/31/2000	Sujon Low
Fan Club	10/31/2000	Yael Ron
Welcome Merons & Everyone!	10/31/2000	Racheal Ankrah
Use of Email	10/30/2000	Willie Loria
Hello and Welcome!	10/30/2000	Sujon Low

BEST COPY AVAILABLE


LearningSpace Y52.1006.093 - Information Technology - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Links Address
Start Discussion
Y52.1006.093 - Information Technology
CourseRoom
Discussions
Assignments
Team Work
by Student
by Date
Courses and sessions to display
50
Internet

DISCUSSIONS - Topic - Comment	Created	Created by
Missing in Action	12/14/2000	The Prof
Information	12/13/2000	The Prof
Team Evaluation	12/13/2000	The Prof
Enrique	12/10/2000	Kathy
Computers meet people	12/10/2000	Karen
Enrique	12/09/2000	Karen
Team assignment Part II	12/09/2000	Alex Ferguson
Information Technology and us!!!	12/09/2000	Fabiola Espinal
Enrique and technology	12/09/2000	Fabiola Espinal
TEAM ASSIGNMENT ANSWERS	12/07/2000	The Prof
POSSIBLE ANSWERS TO INDIVIDUAL ASSIGNMENT	12/07/2000	The Prof
Enrique	12/07/2000	Rieko Tomidiaga
In Japan, teenagers have been the wireless trendsetters for years.	12/05/2000	Rieko Tomidiaga


File Edit View Favorites Tools Help
Links Address
Start Discussion
Y52.1006.092 - Information Technology
CourseRoom
Discussions
Assignments
Team Work
by Student
by Date
Documents to display
50
Internet

Week 6 discussion question	12/09/2000	Sam
EVERYONE Thanks for your efforts.	12/09/2000	Len Turi
IT planning	12/09/2000	Robin
Discussion Question P.409 #3	12/08/2000	Tolu
p.359 - question # 1	12/08/2000	Jason Klarreich
Logical Models	12/08/2000	Fitz
Assignment Professor Turi	12/07/2000	Murray
Missing assignments	12/07/2000	Robin
Good Morning: Test & Last Check for Prior Submissions	12/07/2000	Len Turi
IT Systems Planning	12/06/2000	Bob
WK6 Discussion Question: Importance of logical model development	12/06/2000	Yoon Nam
Prof Len week 4 grade question	12/06/2000	Matthew West
Developing a logical model	12/06/2000	Matthew West
IT planning	12/06/2000	Peter Rosenblatt
Week 6 Discussion Question - IT Systems Planning	12/06/2000	Aki
Purpose of IT Systems Planning	12/05/2000	Charles

BEST COPY AVAILABLE

Cost Effectiveness and Distance Education: A Perspective

Steve Dickey and JoAnna Dickey
Eastern Kentucky University
United States
ecodicke@acs.eku.edu

Abstract: The authors develop a taxonomy of motives for distance education, solutions for delivery and likely application situations. These concrete considerations are contrasted with the abstract character of the intentions commonly professed by institutions offering distance education. The authors discuss the problem of on-campus enrollment loss and provide evidence of its severity on their own campus. The paper concludes with a contrast between cost effectiveness and program image appeal. A major point made in the paper is that the most effective form of distance education would involve multiple delivery media

The purpose of this paper is to place into perspective the idea of distance learning or distance education. The first part of the paper will be devoted to a general overview. The remainder of the paper will be directed to the topic of remote site video classrooms.

Distance education is an alternative to scheduled in-classroom meetings between a teacher and students. Such alternatives are motivated by the desire to execute educational processes so as to allow students to allow students to learn at their own pace, at convenient/flexible times, in their home environment. It would also allow students to avoid travel to campus and allow off-campus instructed courses without instructor travel. These features would potentially provide educational resources to the handicapped. There is also the potential for increased enrollment per instructor. Several of these motivations may be present in a particular instance. Naturally, the best solution depends on the motivations in the case at hand. Different motivations can result in different solutions. Most of the solutions available (except for audio tape) are listed below.

Scheduled Live Instruction:

1. traditional television broadcasts
2. one-way video/audio course - satellite
3. one-way video/two-way audio course - satellite/phone
4. two-way video/audio course - satellite

Unscheduled Instruction:

5. paper correspondence courses
6. video taped presentations
7. interactive CDs
8. internet courses

Please note that courses based on interactive CD's offer instruction equal to internet courses and are relatively prevalent in business training. Textbooks/manuals are typically used with each form of unscheduled instruction. The point being that not that much instruction in 7 and 8 comes from the computer screen unless the student is reading text screens. Such a use of text screens is considered a severe misapplication of media. Moreover, 5 through 8 can readily be combined. One can easily imagine a course with a text for reading and reference, video tapes for instruction, CDs for demonstration and interaction exercises, and paper or the internet for communication, discussion, and assessment. In other words, each media has its best use and some advantage in that use. Therefore, optimal use of media implies use in combinations. The traditional paper correspondence course should be viewed as the low cost and minimal media solution of years past.

There are only three situations: (1) students working at home at their own pace, (2) students working at home paced with TV broadcasts, and (3) groups of students meeting at a local facility. The needs of the first situation have traditionally been met by correspondence courses sometimes with special provisions for handicaps. Multimedia approaches could readily be applied to situation (1) and the internet could be used in various ways. The second situation is the older TV broadcast course concept and will be discussed in terms of its history later. Today, we often think of situation three as what we mean when we say "distance education," the remote site video classroom.

The primary professed motive behind current efforts at remote site video classrooms, RSV classrooms, is educational outreach to the service community. This motive is abstract rather than concrete and so was not listed above. It is an important point that the target audience is stated vaguely as those students who would otherwise not receive instruction. The goal of corresponding instruction is also stated vaguely as an attempt to increase educational attainment. These statements seem to seek a continuing education context as the justification for distance education. It is a certainty that if continuing education was the only possible use for the course, the program would not have the scale to be cost effective. Therefore, the program must sell to those seeking a degree in order to be practical. If nothing else, these points clearly indicate that RSV classrooms were, are, and will remain an experiment in education spurred by technological advance.

One problem with enrollments in RSV courses must be acknowledged; they undermine on-campus enrollments. Students enjoy the convenience of remote site instruction instead of coming to campus. Note that these students are not the target group noted above. Since RSV courses are often located at facilities where off-campus courses are taught, substituting one or the other for on-campus courses is the same situation. Only because offerings at such locations are limited, can we get figures that indicate the extent of the problem. Such a figure is the percent of off-campus enrolled students that are also enrolled in on-campus courses. Zero indicates that there is no problem, while 100% indicates the most extreme problem severity. Because this figure understates the problem, the interpretation of numbers near .25 would be an indication of a substantial drain on the home campus enrollment. For Eastern Kentucky University the figures are:

1994	1995	1996	1997	1998	1999
.25	.26	.30	.29	.31	.29

At least 29% of this off-campus enrollment, and possibly a good deal more, is pure convenience, is a direct loss to on-campus enrollments, and is not in any sense educational outreach. On the other hand, one could argue that such programs pick up most of the students seeking convenience in their early small-scale stage. Then, as the programs move upscale, most of the additional students will be those targeted for outreach services. One could also argue that convenience motivated students provide the scale needed for the practical operation of the program.

For any distance education program, it is desirable for the program to be cost-effective. One-way delivery of RSV courses is dramatically less expensive than two-way delivery. Broadcast is expensive and reception is not. One broadcast site can reach large numbers of reception sites. One-way video with two-way audio comes in as a close second place in low cost and is thought to be nearly as interactive as true two-way delivery.

A one-way RSV delivery system and education television broadcasts are potentially identical. These delivery systems also parallel the auditorium mass lecture course. So it would be valid to ascribe the same shortcomings to all three. How important is interaction? One must acknowledge that it depends on the course. One must also acknowledge the use of mass lecture courses on most major campuses for the very courses that are most often offered in RSV classrooms. Since these mass lecture courses are by their very nature filled with students, it is difficult to argue that such a format compromises enrollments, but the students in such courses have no choice. On the other hand, education television courses have failed for lack of the enrollment sizes necessary to make them cost effective. It would seem that for outreach education, sufficient enrollment is as much a crucial issue as is instructional effectiveness.

While one-way delivery might be the most cost-effective method of achieving education outreach, there is very little interest in one-way delivery. It doesn't provide an image for the institution that appeals as well to grantors, legislators, and alumni as is the case with a one-way video with two-way audio RSV class or a true two-way RSV class. Moreover, we have been referencing potential benefits. Actual benefits will depend on enrollments, and that will depend on the program offering a circumstance that students want. And as noted earlier, that will depend on how the courses lend themselves to a degree program.

A Comparative Project: Web-Based Faculty Development Versus Print-Based Faculty Development

Melissa Diers, M.A.
Learning Environment and Internet Services
University of Nebraska Medical Center
United States
mdiers@unmc.edu

Abstract: This paper is a report on the findings of a study conducted on a graduate level for a thesis project in partial fulfillment of requirements for a Master of Arts in Education with a focus of Instructional Technology. Two random groups of full-time faculty were selected from the total population for a total sample of 200 study participants. One group was requested to complete a questionnaire upon the completion of a web-based faculty development tutorial. The second group was requested to complete a questionnaire upon completing a print-based faculty development tutorial. Findings indicated the full-time faculty who received the web-based faculty development did not perceive themselves as more aware of the content covered in the faculty development than the faculty who completed the print-based faculty development. Faculty Development programs need to continue the traditional approach when introducing and promoting a web-based approach to faculty development.

Introduction

Universities have experienced significant changes over the decades; the impression of instructional technology has been one of the largest impacts on education. The Internet has changed the way we work and communicate, as well as the way we learn. It is serving as a vehicle for the exchange of information regardless of social, economic or geographical differences (Charp, 2000). Tools and media, which are offered via the World Wide Web have expanded the arena and have empowered educators to transform the teaching and learning process.

Many factors contribute to this change; one is "universities today face a number of internal and external pressures to become actively involved in educational applications of new technologies. Some of these pressures include increasing public access to information technology, government funding priorities for initiatives that support the development of distributed learning networks, increasing competition for students, and the need to provide cost-effective high-quality education to a greater number of students" (Rossner, Stockley, 1997).

Another factor is the indisputable fact that the citizens of the world cannot afford to avoid participation in cyberspace. The nature of the workforce requires higher technological skill level (Hudson Institute, 1987). "Thus, an "elitist" view of education will no longer serve our fast technological, globally-connected society. Faculty must be encouraged to expand their views of education and to grow professionally. Students, like faculty, must be prepared to flourish in the increasingly technological society (Millis, 1994). This change in societal expectation requires the faculty and students to expand their educational and technological skill set. The enhanced faculty technological skill set will contribute to the process of mentoring students to become active citizens within our community and prepare the students for future careers.

To enhance the technological and educational skill set of the faculty an innovative approach to faculty development needs to be implemented. In the past faculty development has appeared in various contexts, typically focused on enhancing the talents, expanding the interests, improving the competence, and facilitating the professional and personal growth of faculty, primarily in their role as instructors (Gaff, 1975).

In recent years, faculty development strategies have taken a different approach by addressing instructional improvements through skill development, enhancing support services, and ensuring that institutional reward structures reflect the challenges of the effective instructor integrating educational technologies (Willis, 1994).

The use of the World Wide Web as an instructional method represents a new way of looking at instruction and emphasizes the importance of the recent changes in faculty development. "Web-based instruction provides exciting opportunities for universities to introduce sophisticated, interactive technologies into more traditional and familiar instructional settings. These technologies will allow for greater dissemination of information and greater access to knowledge for participants within and beyond the university community" (Rossner & Stockley, 1997).

The expense of integrating the instructional technology has required many universities to restructure budget allocations. Unfortunately, many times the budget provides for hardware and software, but is not sufficient for instructional technology faculty development programs. This oversight has made it more difficult for the faculty to juggle traditional demands with the necessity to enhance technological skill sets, change of instructional methodology, and seamlessly integrate web-based technology into instruction.

Recently, the University of Nebraska Medical Center has attempted to raise the faculty level of awareness of new methods of instruction. The communication model, which has proven to be very effective, has been one-to-one sessions between a faculty member and a consultant. Though this model has been successful it has not been widespread due to the lack of personnel. This study, focused on web-based instruction, represented a cost-effective faculty communication model that has the potential to reach more faculty members by offering a self-managed introduction to the university supported web-based applications and available consultant services when integrating technology into curriculum.

This study focused on the impact of self-perceived faculty awareness of available University of Nebraska Medical Center web-based applications and consultant services after the completion of a researcher-designed web-based faculty development tutorial.

The Study

Recently, the University of Nebraska Medical Center has attempted to raise the faculty level of awareness of new methods of instruction. The communication model, which has proven to be very effective, has been one-to-one sessions between a faculty member and a consultant. Though this model has been successful it has not been widespread due to the lack of personnel. This study, focused on web-based instruction, represented a cost-effective faculty communication model that has the potential to reach more faculty members by offering a self-managed introduction to the University of Nebraska Medical Center supported web-based applications and available consultant services when integrating technology into curriculum.

At the time of the study there were 557 full-time faculty, two random groups were selected from the total population for a total sample of 200 study participants. One group was requested to complete a questionnaire upon the completion of a faculty development web-based tutorial. The second group was requested to complete a questionnaire upon completing a print-based faculty development tutorial. Both questionnaires contained three sections; section one contained demographic information, section two contained information regarding the awareness of the available web-based applications and section three contained information regarding the awareness of the available consultants when integrating instructional technology.

Immediately after the random group assignments were made, the researcher sent a packet to both Group A and Group B. The packet for Group A included a cover letter which outlined the purpose of the faculty development tutorial and directions of how to complete the duties of a study participant, campus self-addressed return envelope, and a researcher-designed questionnaire to be completed upon the conclusion of the researcher-designed web-based faculty development tutorial. The packet for Group B included a cover letter which outlined the purpose of the tutorial and directions on how to complete the duties of a study participant, self-addressed campus return envelope, and a researcher-designed questionnaire to be completed upon the conclusion of reading the researcher-designed print-based faculty development tutorial.

A blanket reminder letter to Group A and Group B. The individuals in each group who had not completed the questionnaire prior to March 13, 2000, were no longer considered part of the study.

The raw score means of Group A and Group B questionnaires were calculated, by sections:

- Section one: demographic information,
- Section two: information regarding the awareness of the available web-based applications and
- Section three: information regarding the awareness of the available consultants when integrating instructional technology.

A one-tailed t-test with a .05 level of significance was used to determine if there was a significant difference between the means of each group.

The data and findings of the study provided information about the self-perceived awareness levels of UNMC faculty members exposed to the researcher-designed web-based faculty development tutorial compared to those who were exposed to the researcher-designed print-based faculty development tutorial. Such information may provide educators with guidance towards beneficial instructional methodologies for faculty development. Such data may help those responsible for the faculty development make better decisions about suitable approaches.

Findings

The study was limited to measuring University of Nebraska Medical Center faculty self-perceived awareness level related to supported web-based applications and consultants, which are available to faculty during the process of integrating web-based instructional technology. The perceptions of the faculty were inventoried with a researcher-designed questionnaire after completing a researcher-designed web-based faculty development tutorial or a researcher-designed print-based development tutorial.

Entire Questionnaire

The total questionnaire response rate was 26.5%, with a total of 53 responses. Group A participants who were requested to complete the researcher-designed web-based faculty development tutorial and questionnaire had a response rate of 24 out 100 of the sample population. Group B participants who were requested to complete the researcher-designed print-based faculty development tutorial and questionnaire had a response rate of 29 out of 100 of the sample population.

The researcher utilized the reported results to determine the means, standard deviations, and variances for the raw scores of the entire questionnaires for both groups. A one-tailed t-test with a .05 level of significance standard was used to determine if the difference between Group A and Group B means were significant. The results showed that Group B (print-based group) (M=3.92, SD=.80) perceived themselves to be more aware of UNMC supported web-based applications and consultant services available to assist in the integration of web-based technologies than the Group A (web-based group) (M=3.15, SD=.82) (t (51) = -3.44, p=.0024, one-tailed test).

Questionnaire: Section One

The first section of the questionnaire consisted of 7 items on the print-based questionnaire and 9 items on the web-based questionnaire. The items pertained to demographic information and specific questions concerning the researcher-designed print-based and web-based tutorials.

Gender Distribution

The gender distribution within the total population of the University of Nebraska Medical Center full-time faculty consisted of 373 (66.9% of total population) male faculty and 184 (33.1% of total population) female faculty.

Group A (web-based group) sample population consisted of 69 (69% of Group A sample population) male faculty and 31 (31% of Group A sample population) female faculty. The Group A response rate population was

17 (70.9%) male participants and 7 (29.1%) female participants.

Group B (print-based group) sample population consisted of 64 (64% of Group B sample population) male faculty and 36 (36% of Group B sample population) female faculty. The Group B response population was 20 (69%) male participants and 9 (31%) female participants.

Based on statistical analysis the researcher concluded the sample population and respondent population of both groups were reasonably accurate representations of the entire gender distribution of UNMC full-time faculty population.

College Affiliation

The college affiliation population of the total University of Nebraska Medical Center full-time faculty consisted of 393 (71%) from the College of Medicine, 84 (15%) from the College of Nursing, 28 (5%) from the College of Pharmacy, and 52 (9%) from the College of Dentistry.

Group A sample population consisted of 70 (70%) College of Medicine faculty, 15 (15%) College of Nursing faculty, 5 (5%) College of Pharmacy faculty, and 10 (10%) College of Dentistry faculty. Group A response population consisted of 15 (62.6%) College of Medicine, 4 (16.6%) College of Nursing, 3 (12.5%) College of Pharmacy, and 2 (8.3%) College of Dentistry.

Group B sample population consisted of 71 (71%) College of Medicine faculty, 14 (14%) College of Nursing faculty, 5 (5%) College of Pharmacy faculty, and 9 (9%) College of Dentistry faculty. Group A response population consisted of 19 (65.5%) College of Medicine, 5 (17.2%) College of Nursing, 2 (6.8%) College of Pharmacy, and 3 (10.3%) College of Dentistry.

The College of Nursing and College of Pharmacy respondent population of Group A was greater than the sample population. The College of Medicine and College of Dentistry respondent population of Group A was lower than the sample population.

The College of Nursing, and College of Pharmacy Group B respondent population was greater than the sample population. The College of Medicine and Dentistry respondent population of Group B was lower than the sample population.

Overall the sample population and respondent population was an accurate representation of the college affiliation.

Age

The mean age of the respondent population was 41 to 50 years of age. Group A consisted 4 participants 40 or under, 12 participants 41 to 50, 6 participants 51 to 60, and 2 participants greater than 60. Group B consisted 7 participants 40 or under, 10 participants 41 to 50, 11 participants 51 to 60, and 1 participant greater than 60.

Skill Level

The Internet is making an impact on many aspects of our lives. It has changed the way we work and communicate, as well as the way we learn (Charp, 2000). All of the study participants have used the Internet, 17% self-rate their skill level at Beginner, 62% self-rate their skill level at Intermediate, 19% self-rate their skill level at Advanced, and 2% self-rate their skill level at Expert with using the Internet (World Wide Web).

The total respondent population reported only seven (13.2%), two Group A (web-based) respondents and five Group B (print-based) respondents, had personally developed an entire World Wide Web-based course. The total respondent population reported 18 (33.9%), seven Group A respondents and eleven Group B respondents, have personally supplemented a course with the World Wide Web-based materials.

Time Allotted to Completing the Tutorial

The mean time respondents allotted to complete the tutorials was ten to twenty minutes. Group A reported an average time allotment of 21 to 30 minutes and Group B reported an average time allotment of 10 to 20 minutes.

Questionnaire: Section Two

The second section of both questionnaires consisted of eleven items that addressed the level of self-perceived awareness of the UNMC supported web-based applications.

The researcher used the reported results to determine the means, standard deviations, and variances for the raw scores on section two of the questionnaires for both groups. A one-tailed t-test with a .05 level of significance standard was used to determine if the difference between the means were significant.

Questionnaire: Section Three

The third section of both questionnaires consisted of four items that addressed the level of self-perceived awareness of UNMC consultant services available to assist in the integration of web-based technologies.

The researcher used the reported results to determine the means, standard deviations, and variances for the raw scores on section three of the questionnaires for both groups. A one-tailed t-test with a .05 level of significance standard was used to determine if the difference between the means were significant.

Conclusions

The results of the second section of the questionnaire showed that Group B (print-based group) (M=3.90, SD=.81) perceived themselves more aware of University of Nebraska Medical Center supported web-based applications than the Group A (web-based group) (M=3.20, SD=.89) (t (51) = -2.97, p=.0088, one-tailed test).

The results of the third section of the questionnaire showed that Group B (print-based group) (M=3.96, SD=.87) perceived themselves more aware of the available consultant services available to assist in the integration of web-based technologies than the Group A (web-based group) (M=3.28, SD=.98) (t (51) = -2.65, p=.0212, one-tailed test).

Both questionnaires proved to be reliability based on the results of the Cronbach's alpha test. The statistical findings of the entire questionnaire, section one, section two, and section three was discussed. Section one compared the gender, college affiliation, age, skill level, time allotted to completing the tutorial, and printing the web-based tutorial of the two response groups. Section two and three concluded Group B (print-based), the participants that completed the print-based tutorial showed a significantly higher level of self-perceived awareness when compared to Group A (web-based), the participants that completed the web-based tutorial.

The implications of the results validate the current form of faculty development and emphasize the necessity of the continuation of the current programs focusing on the integrating technology into instruction. An expansion of the number of available consultants might be necessary to gain a broader coverage of the full-time faculty. A print-based promotion emphasizing the potential outcomes and focus of technology within the classroom needs to be implemented. One primary potential outcome of the promotion would be to contribute to the cultural transition period from traditional role of the faculty and student to the new faculty and student role.

The researcher recommends future studies to consider 1) the impact of college culture, 2) use of the Internet, and 3) a comparison between UNMC, a medical university to a non-medical university. With further studies, the impact of web-based faculty development can be modified and embraced to serve the needs of the UNMC full-time faculty.

Based on the results, the study showed the UNMC full-time faculty who received the web-based tutorial (Group A) did not perceive themselves as more aware of the UNMC supported web-based applications and consultant services available to assist in the integration of web-based technologies than the print-based group (Group B).

References

Charp, S. (2000) The role of the Internet. *T.H.E. Journal*, March, 8 & 10.

Gaff, J.G. (1975). *Towards faculty renewal.* San Francisco: Jossey-Bass.

Hudson Institute (1987). *Workforce 2000: work and workers for the 21st century.* Washington, DC: U.S. Government Printing Office.

Millis, B. (1994). Faculty development in the 1990s: what it is and why we can't wait. *Journal of Counseling & Development, May/June, Vol. 72, Issue 5*, 454.

Rossner, V., & Stockley, D. (1997). *Web-Based Instruction.* Englewood Cliffs, New Jersey: Educational Technology Publications.

Willis, B. (1994). *Distance Education Strategies and Tools.* Englewood Cliffs, New Jersey: Educational Technology Publications.

Assessing Best Practices in Online Learning: A Review of the Literature

William M. Dwyer
The Alabama Center for Research on Online Learning
The University of Alabama
United States
wdwyer@bama.ua.edu

Dennis W. Sunal
The Alabama Center for Research on Online Learning
The University of Alabama
United States
dsunal@bamaed.ua.edu

Judy L.Giesen
The Alabama Center for Research on Online Learning
The University of Alabama
United States
jgiesen@bamaed.ua.edu

Cynthia Sunal
The Alabama Center for Research on Online Learning
The University of Alabama
United States
cvsunal@bamaed.ua.edu

Kathy Trundle
The Alabama Center for Research on Online Learning
The University of Alabama
United States
ktrundle@bamaed.ua.edu

Abstract: This literature review provides an overview of recent research that has been conducted on online learning, as well as indicating the extent and type of research being carried out. Twenty-five representative studies were selected and categorized. Addressing four questions can best summarize the review of research on online learning. They are: 1) What scientific research design criteria and types of theory can be applied to evaluate the quality of research on online learning environments? 2) How do the online learning research examples that have been sampled meet the criteria for scientific research? 3) What can we learn from the results of the review of research on online learning based on the type of research performed? 4) What can we conclude from the results of research on online learning environments to date?

Introduction

Delivering instruction online is a relatively new phenomenon for educators. Concerns over student achievement and attitudes, course design and delivery, course evaluation, instructor abilities, and attitudes are currently being explored by researchers; however, detailed evaluations of these factors utilizing well-developed research plans are relatively scarce at this time. The purpose of this literature review is to provide an overview of research that has been conducted on online learning, as well as to indicate the extent and type of research being carried out. Two research questions to be answered are: What can we learn from the results of the review of research on online learning based on the type of research performed? What can we conclude from the results of research on online learning environments to date?

Planned professional use of this literature review includes; 1) identifying best online learning practices to serve as a basis for the development of guidelines and evaluation tools for online interactive learning environments, 2) developing research design strategies for exemplary online modules addressing time, place, and physical limitations for traditional and nontraditional students in education and engineering, and 3) utilization of constructivist pedagogy as the foundation of the development of the interactive learning exemplars.

Review of Research Process

The review concentrated on research findings published recently during which online learning became a common part of the use and development of the Internet. The purpose of the review was to show what is being selected, categorized, and published in the field. The professional literature sources searched were selected as representative of the core of literature databases in the area of online learning and classroom teaching and learning. The sources included Educational Resources Information Center (ERIC), Dissertation Abstracts, abstracts from the annual and regional conferences of the American Educational Research Association (AERA) and the National Association for Research on Science Teaching (NARST), Internet online journals specializing in research, and specific science education journals publishing research on learning.

Nominations of citations to consider were related to several selection criteria. The first required citations to be reporting results of studies published between 1997 and 2000. Few pre-1997 studies of online learning warranted inclusion. The technology has been changing so quickly that recent studies use significantly evolved hardware and software rendering possibly different conclusions. The second criterion required that the study relate to courses or modules involving online learning providing distance education via the Internet. The third criterion required the citation to relate to evidence of learning outcomes of students involved. Particular priority was made to find studies that compared online and classroom learning outcomes. An effort was made to eliminate citations that focused on "how to" and "show and tell." Finally, citations relating only to courses and modules for higher or adult education were sampled.

Multiple searches were performed on each database. Searching on the queries related to "online and classroom learning" and "online courses and classroom teaching" yielded more than 400 citations. Adding the term "research" reduced the yield to 155 citations. Full articles obtained for these 155 citations were read and reviewed. Final selection of the studies to be included in this review of research applied the four criteria cited above. The final list included 25 studies. The studies, by type, are as follows:

Quantitative and Qualitative Studies

Davies and Mendenhall (1998); Wegner, Holloway, and Crader (1997); Jewett (1998; two studies); Ryan (2000); Teeter (1997); Blum (1999); Newman, Johnson, Cochrane, and Webb (1996); Wegerif (1998).

Pre-Experimental and Pilot Studies

De Simone, Schmid, and Lou (2000); Saunders, Malm, Malone, Nay, Oliver, and Thompson, Jr. (1997); Gaud (1999); Shih, Ingebritson, Pleasants, Flickenger, and Brown (1998); McLellan (1997); Mende (1998); Schlough and Bhuripanyo (1988); Powers, Davis, and Tarrence (1998); Hegngi (1998); Loomis (2000); Stith (2000); Kroder, Suess, and Sachs (1999); Vrasidas and McIssac (1999).

Large Surveys

McNaught, Kenny, Kennedy, and Lord (1999); Rossman (1999); Jiang and Ting (1999).

The 25 studies were reviewed and evaluated using the following tasks and measures: type of study and comparison basis, number of subjects, data collection instruments, outcome variables measured, courses studied, and results and conclusions based on evidence obtained from students outcomes. A narrative review of the 25 selected studies, grouped by online versus traditional learning, student and teacher perceptions, and reports of online course design, was completed, as well as a summary table of this information.

Discussion of the Review of Research

Addressing four questions can best summarize the review of research on online learning presented here. They are:

1. What scientific research design criteria and types of theory can be applied to evaluate the quality of research on online learning environments?
2. How do the online learning research examples that have been sampled meet the criteria for scientific research?
3. What can we learn from the results of the review of research on online learning based on the type of research performed?
4. What can we conclude from the results of research on online learning environments to date?

Question 1: What scientific research design criteria and types of theory can be applied to evaluate the quality of research on online learning environments?

In answer to the first question, the literature identifies specific design criteria for quantitative and qualitative research (Brause & Mayher, 1991). Among these criteria are random sampling, appropriate group size, controlled variables, and internal and external validity that are addressed in the research design (Campbell & Stanley, 1963). For qualitative research sample criteria are a clear statement of the research purpose and question, research design, sample population, observer researcher, and the data analysis procedures (Stake, 1995; Denzin & Lincoln, 1994; Wolcott, 1990). Types of theory used to categorize the research studies can be summarized with a hierarchy of categories (Reynolds, 1971; Snow, 1973). The least useful type of theory involves creation of typologies that can best be identified as descriptive research. The next level of theory involves looking for correlation between events. The third level involves cause and effect. This level involves an experimental design with control and experimental groups. It may involve application of inferential statistics. The fourth and fifth levels of theory, sense of understanding and control, were not found in the research reviewed.

Question 2: How do online learning environment research studies that have been sampled meet criteria for scientific research?

In reviewing the research literature selected for online learning, no study was found to meet the scientific research design criteria given above for Question 1. The research designs were flawed, making the conclusions derived from the studies open to debate. Of the 25 studies reviewed, 16 had serious design flaws. Using these studies, it is not possible to determine whether learning online results in more positive attitudes and higher achievement, than does learning in the traditional classroom context. These studies do not meet the third level type of theory. They were, at best, pre-experimental case studies of web design courses. They used the development of typologies or determining correlations among events as the main form of analysis.

The remaining nine studies compared traditional with Web-based courses. Seven of these studies were quantitative studies and two were qualitative. In each case, the study had design flaws. Some of these flaws in the quantitative studies included: lack of use of random sampling, small sample size, lack of control of alternative variables, treatment periods that were too short, and lack of assessment of instruction or instructor quality. The two qualitative studies were designed for hypothesis generation rather than hypothesis testing. Because of a lack of triangulation, small number of subjects, and the few specific situations studied, results cannot be generalized beyond these studies' settings.

In both types of studies there was a failure to describe adequately pedagogical methods used. There was no description of the prior knowledge students brought into the learning situation, such as knowledge of the content taught or their ability and experience with the technology used. Therefore, it is not possible to determine whether improvement in achievement was the result of online instruction or other uncontrolled factors.

Question 3: What can we learn from the results of the review of research on online learning environments based on the type of research performed?

In the studies selected, it was concluded that online instruction was as good as, or better than, traditional instruction, or that online learning is a viable strategy. These conclusions were not warranted because of the flaws in research design. However, online learning research in the selected studies can inform us in regard to potential variables and best practices that should form the basis of future research. The research base to date should be seen as a basis to begin hypothesis-generating research. It informs us about suspected and potential variables that should be considered in creating research designs and performing the research process to determine cause and effect for higher levels of theory and more useful knowledge.

At the present time, the lack of adequately designed research does not allow us to rate online instruction as better, or even the same, as traditional forms of classroom instruction. However, the results of the studies reviewed provide useful information to be explored using the media with research-supported classroom pedagogical practices. Some of these pedagogical practices include adequate and timely feedback, student-student and student-teacher interaction, and a safe and supportive climate for learning. Thus, the results of the online studies demonstrate that potentially viable online courses need strong consideration of structuring, timing, and the use of specific pedagogical practices. Studies of online courses demonstrate possible approaches to successfully implement these pedagogical practices.

Question 4: What can we conclude from the results of research on online learning environments to date?

The reviewed studies provide some support for the use of particular practices in an online learning format. These best practices are described in Table 1 and are grouped into four categories: 1) student behaviors; 2) faculty-student interactions; 3) technology support; and 4) learning environment. These best practices are associated with higher positive learning attitudes and achievement. Where they can be connected to, or derive from, research-supported pedagogical practice these best practices serve as potentially effective practices in online course design.

Categories and Practices	Citations
Student Behaviors	
Demonstrate their prerequisite technology skills at the beginning are adequate for hardware, software and web-site use	Stith (2000), McNaught et al. (1999), Vrasidas & McIsaac (1999), Wegner et al. et al. (1997)
Seek opportunities and support to interact with instructor and other students	Ryan (2000,) Wegner et al., (1997), Smith & Benscoter (1999)
Actively participate in all online activities	Saunders, (1997), Mende (1998)
Active involvement writing and interaction in web-based courses (improves student writing performance)	Jewett (1998)
Use a variety of communication techniques to enhance online learning	Shin et al. (1998), Mclellan (1997)
Personalize themselves by publishing online biographies and photographs to allow other members of the class to visualize them	Mclellan (1997)
Seek assistance in understanding and mastering different learning strategies	Shin et al. (1998)
Demonstrate prerequisite and become more proficient in technology communication skills	Vrasidas & McIsaac (1999)
Faculty-Student Interactions	
Provide clear and adequate guidance	Wegner et al. (1997), Kroder et al.

	(1998)
Use action research regularly to evaluate the success/failure of course & meet student concerns	Gillani (1998)
Personalize communications by/with student-student and student-teacher	Jewett (1998), Powers et al. (1998)
Use a variety of communication techniques to provide for greater empathy and personal approach than e-mail and web site alone	Mclellan (1997)
Plan for increased time for student interactions as compared to traditional courses	Ryan (2000)
Delineate in clear terms the institution's policy on cheating and plagarism at start	Gray (1998)
Maintain a separate email account for web courses	Gray (1998)
Forward to all students, responses to frequently asked questions to avoid duplication	Gray (1998)
Reduced load and increased support are required to develop course materials	Gaud (1999)
Provide continuous and frequent feedback and support	Vrasidas & McIsaac (1999), Jiang & Ting (1999)
Provide scaffolding for virtual discourse construction	Pincas (1998)
Emphasize the importance of good study skills throughout online course	Loomis (2000)
Monitor closely the progress of each student	Loomis (2000)
Provide prompt feedback to students	Loomis (2000), Rossman (1999)
Create opportunities to coach and facilitate student construction of knowledge.	Miller & Miller (1999)
Insure that negative comments to students are given privately, preferably through a phone call	Rossman (1999)
Clearly dlineate course requirements	Rossman (1999)
Technology Support	
Ensure a low level of technological difficulties in accessing website and communication	Jewett (1998), Cornell (1999), Wegner et al. (1997)
Provide adequate, friendly, easy, continuous technical support	Teeter (1997), McNaught, et al. (1999), Davies & Mendenhall (1998), Kroder et al. (1998), Gillani (1998)
Learning Environment	
Use of structured activities to provide an effective framework for online learning	Powers et al (1998), De Simone (2000); Mendes (1998)
Mandate smaller class sizes for online courses to give the faculty appropriate time to deliver quality instruction	Gaud (1999)
Use flexible deadlines in online courses (helps to motivate students, maintain communication, and allow for technical problems)	Mclellan, 1997
Create social interaction through group collaboration (necessary for high achievement)	Wegner et al., (1997), Blume (1999), Jiang & Ting (1999), Kroder et al. (1998), DeSimone (2000), Mende (1998)
Use streaming audio for reading online	Kroder et al. (1998)
Organize web site to allow the student to interact with the content and other students and instructor	Gillani (1998)
Create an online environment that is welcoming, nuturing, and safe	Bonk & Cummings (1998)
Present course content in a manner that hierarchically structures the sequence of information	Miller & Miller (1999)
Obtain student feedback to insure accuracy of understanding	Miller & Miller (1999)
Provide opportunities for students to question the instructor to insure accuracy of understanding	Miller & Miller (1999)
Create opportunities for students to communicate with each other in	Miller & Miller (1999)

order to share their understanding of course content	
Present a problem-solving situation in a realistic context	Miller & Miller (1999)
Provide opportunities for learners to collaboratively construct knowledge based on multiple perspectives, discussion, and reflection	Miller & Miller (1999)
Provide opportunities for students to articulate and revise their thinking in order to insure the accuracy of knowledge construction	Miller & Miller (1999)
Ensure an equitable environment exists for gender differences in learning styles, participation barriers, and communication	Blum (1999)
Include cooperative and collaborative learning in courses to distribute workload through group (supports female students preferred method of connected learning)	Blum (1999)
Promote gender equality by encouraging females to post messages while asking males to subside if a pattern of male domination is noticed	Blum (1999)
Ensure an equitable learning environment exists for all students	Blum (1999)
Allow time for reflection at the end of the course	Wegerif (1998)
Include a "warm-up" period with light-hearted exercises aimed to help students get to know one another	Wegerif (1998)
Start an online course with all students together at the same time	Wegerif (1998)
Provide equal access to the shared conversation in online course	Wegerif (1998)
Provide opportunities for students to control online learning and structure it for themselves	Wegerif (1998)
Provide discussion forums which encourage open and honest dialog	Rossman (1999)
Conduct a teleconference during and at the end of the course to discuss successes and problems	Rossman (1999)
Use computer conferencing to develop overall critical thinking skills	Newman (1996)

Table 1: Best Practices for Online Learning Environments

References

Blum, K. D. (1999). Gender differences in asynchronous learning in higher education: Learning styles, participation barriers and communication patterns. *Journal of Asynchronous Learning Networks*, [online serial], *3*(1). Available: http://www.aln.org/alnweb/journal/vol3_issue1/blum.htm

Brause, R., & Mayher, J. (1991). Search and research: What the inquiring teacher needs to know. New York: The Falmer Press.

Campbell, D., & Stanley, J. (1963). Experimental and quasi-experimental designs for research. Chicago: Rand McNally and Company

Davies, R., & Mendenhall R. (1998). *Evaluation comparison of online and classroom instruction for HEPE 129—fitness and lifestyle management course.* Salt Lake City, UT: Brigham Young University. (ERIC Document Reproduction Service No. ED 427 752).

Denzin, N., & Lincoln, Y. (Eds.) (1994). Handbook of qualitative research. Thousand Oaks, CA: Sage Publications.

De Simone, C., Schmid, R., & Lou, Y. (2000). A distance education course: A voyage using computer-mediated communication to support meaningful learning. AERA 2000.

Gaud, W. S. (1999). Assessing the impact of Web courses. *Syllabus, 13* (4), 49-50.

Hegngi, Y. N. (1998). *Changing roles, changing technologies: The design, development, implementation, and evaluation of a media technology and diversity on-line course.* Paper presented at the 1998 American Educational Research Association Annual Meeting.

Jewett, F. (1998). *Course restructuring and the instructional development initiative at Virginia Polytechnic Institute and State University: A benefit cost study.* Blacksburg, VA: Virginia Polytechnic Institute and State University. (ERIC Document Reproduction Service No. ED 423 802)

Jiang, M., & Ting, E. (1999). A study of students' perceived learning in a Web-based online environment. Presented at Webnet 99 World conference, Honolulu, HI.

Kroder, S. L., Suess, J., & Sachs, D. (1998). Lessons in launching Web-based graduate courses. *T.H.E. Journal, 25*(10), 66-69.

Loomis, K. D. (2000). Learning styles and asynchronous learning: Comparing the LASSI model to class performance. *Journal of Asynchronous Learning Networks,* [online serial], *4*(1). Available: http://www.aln.org/alnweb/journal/vol4_issue1/loomis.htm

McLellan, H. (1997). Information design via the Internet. (Education Document Reproduction Service, No. ED 408 942)

McNaught, C., Kenny, J., Kennedy, P., & Lord, R. (1999). Developing and evaluating a university-wide online distributed learning system: The experience at RMIT University. *Educational Technology & Society,*[online serial], *2*(4). Available: http://ifets.ieee.org/periodical/vol_4_99/mcnaught.html.

Mende, R. (1998). *Hypotheses for the virtual classroom: A case study.* Paper presented at the IT97 Conference.

Newman, D. R., Johnson, C., Cochrane, C., & Webb, B. (1996). An experiment in group learning technology: Evaluating critical thinking in face-to-face and computer-supported seminars. *Interpersonal Computing and Technology, 4*(1), 57-74.

Powers, S. M., Davis, M., & Torrence, E. (1998). *Assessing the classroom environment of the virtual classroom.* Paper presented at the Annual Meeting of the Mid-Western Educational Research Association.

Reynolds, P. (1971). A primer in theory construction. Indianapolis: Bobbs-Merrill Educational Publishing.

Rossman, M. H. (1999). Successful online teaching using an asynchronous learner discussion forum. *Journal of Asynchronous Learning Networks,* [online serial], *3*(2). Available:
http://www.aln.org/alnweb/journal/vol3_issue2/Rossman.htm

Ryan, R. (2000). Lecture and online construction equipment and methods classes. *T.H.E. Journal, 27*(3), 78-83.

Saunders, N., Malm, L., Malone, B., Nay, F., Oliver, B. & Thompson, Jr., J. (1997). Student perspectives: Responses to Internet opportunities in a distance opportunities environment. (Education Document Reproduction Service, No. ED 413 816)

Schlough, S., & Bhuripanyo, S. (1998). *The development and evaluation of the Internet delivery of the course "Task Analysis."* Paper presented at the SITE 98: Society for Information Technology & Teacher Education Annual International Conference.

Shih, C. C., Ingebritsen, T., Pleasants, J., Flickinger, K., & Brown, G. (1998). Learning strategies and other factors influencing achievement via Web courses. (Educational Document Reproduction Service, No. ED 422 876.

Snow, R. (1973). Theory construction for research on teaching. In Travers, R. (ed.) Second handbook for research on teaching. Chicago: Rand McNally and Company

Stake, R. (1995). The art of case study research. Thousand Oaks, CA: Sage Publications.

Stith, B. (2000). Web-enhanced lecture course scores big with students and faculty. *T.H.E. Journal, 27*(28), 21-28.

Teeter, T. (1997). Teaching on the Internet. Meeting the challenges of electronic learning. (Education Document Reproduction Service, No. ED 418 957).

Vrasidas, C., & Stock McIssac, M. (1999). Factors influencing interaction in an online course. *The American Journal of Distance Education,* 13 (3), 22-35.

Wegerif, R. (1998). The social dimension of asynchronous learning networks. *Journal of Asynchronous Learning Networks,* [online serial] *2*(1). Available: http://www.aln.org/alnweb/journal/vol2_issue1/wegerif.htm

Wegner, S., Holloway, K., & Crader, A. (1997). *Utilizing a problem-based approach on the World Wide Web.* Southwest Missouri State University. (ERIC Document Reproduction Service No. ED 414 262).

Wolcott, H. (1990). Writing up qualitative research. Newbury Park, CA: Sage Publications.

Distance Learning: An Examination of Perceived Effectiveness and Student Satisfaction in Higher Education

Donna M. Gabrielle
The Florida State University
Department of Educational Research, Tallahassee, Florida, USA
gabrielle@mailer.fsu.edu

Abstract: Distance learning is a tremendous issue due to paradigm shifts in pedagogy and business. Data was collected from eight Florida postsecondary institutions, then multiple regression and conditional regression analyses were conducted. Findings indicated that technical quality and student interaction were significant predictors of effectiveness and satisfaction for distance students. When using personal characteristics as predictors, younger students, males, and students with higher levels of education were more likely to report higher levels of both instructional effectiveness and satisfaction. Finally, distance students indicated less satisfaction and effectiveness than traditional students. These differences, as well as student-material interaction, perceived quality, and prior distance experience, were found to be statistically significant using two-tailed t-tests. This research suggests that there are distinct factors that predict satisfaction levels and perceptions by distance students of the effectiveness of instruction they are receiving, stressing the importance of focusing on quality and interaction between students and instructors.

Introduction

Distance learning involves a series of controversial issues due to enormous paradigm shifts in pedagogy, demographic changes, increasing demands for both formal and continuing education, plus spiraling education costs. A growing number of new broadcast and interactive communication technologies further complicate the issues.

Prior research has pointed to the effectiveness of carefully conceived interactive radio, educational television and distance learning programs. Many of these successes, however, are shadowed by low student completion rates. Consequently, there are numerous concerns over what factors help determine students' willingness to initiate and complete distance programs. This study examines a series of educational, technological and personal characteristics that predict students' perceptions of instructional effectiveness and satisfaction with distance learning classes.

Distance Education and Distance Learning

Distance education has its roots in correspondence courses, which became popular in the late 19th century. By some accounts, correspondence education dates back to Biblical times (Bates, 1995; Holmberg, 1986), however, one of the first documented references to organized distance education was in the March 20, 1728 edition of The Boston Gazette. An instructor of the "New Method of Short Hand", Caleb Phillips, advertised that "Persons in the Country desirous to Learn this Art, may by having the several Lessons sent Weekly to them, be as perfectly instructed as those that live in Boston" (Battenberg 1971, p. 44, cited in Holmberg, p. 6).

More than two centuries later, the demand for education increased immensely as hundreds of thousands of World War II troops were granted benefits under the Government Issue (GI) Bill. Some of this demand was met through correspondence courses, but in 1969, the pass rate for such courses was less than 5 percent (Garrison, 1989). Partly in response to these low pass rates, correspondence education evolved into courses that use new educational paradigms and communication technologies to enhance traditional print media and provide more reciprocated communication. During this evolution the term "distance education" was developed (Holmberg, 1986).

Sukow (1992, p. 47) noted that the meaning of "distance learning" tends to change radically, depending on which company or government organization is approached and the technology employed. Distance learning via interactive technology refers to delivery of video, audio, and data at one site to one or more sites, where the remote sites can interactively and synchronously or asynchronously communicate through audio, text, or both video and audio to the host site. This includes instruction through Instructional

Television Fixed Services (ITFS), satellite, cable, fiberoptics, the Internet, the World Wide Web (WWW), CD-ROM, and forms of video conferencing.

Simultaneous to the progression of interactive technologies, comparable changes have been occurring in pedagogy. This shift has been brought about, in part, by the fact that educational institutions now see the necessity to reach people who might not otherwise be reached. There similarly is a growing number of work force groups that require continuing education. Furthermore, the emphasis in education has now changed, shifting much of the paradigm from teaching to learning.

In addition to the paradigm shift in U.S. education, there also are changing demographics. The average age of the population is increasing while the number of 18-21 year old college students is decreasing (Gessner, 1987). The majority of these older students are already in the work force. Many are extremely busy; most are interested in part-time education, and some are interested in lifelong learning (Burnham and Seamons, 1987). Between 1970 and 1993, part-time enrollments in American higher educational institutions increased 128 percent from 3 million to 6.6 million, while growth in full-time enrollments only increased 38 percent (Brown, cited in Johnson, 1995, p. 22). Educational institutions are expanding their clientele to include people who may have never thought of attaining a higher education.

The Open University (OU) in Great Britain was one of the first educational facilities to use technology for distance learning. When OU began offering courses in Great Britain in 1971, it changed the reputation of distance learning by providing quality education to students through the use of a variety of media (Tait, 1991). This concept of using a variety of media in a distance learning environment was considered a "radical innovation" (Bates, 1984). However, what was at one time revolutionary is now becoming commonplace. From the Teleuniversité in Quebec to the Fernuniversität in West Germany to the University of Paisley in Hong Kong, distance learning is becoming widespread. Many of these distance learning programs use innovative broadcast and interactive communication technologies.

Distance Learning Effectiveness

Previous evaluations of distance learning have been primarily concerned with its effectiveness. Research has found that exam pass rates of distance students are comparable to exam pass rates of full-time students (Perraton, 1991; Zigerell, 1991). Researchers from hundreds of studies have drawn similar conclusions. Nearly 90% of the comparisons between media assisted distance learning and traditional education conditions have shown no appreciable differences in student achievement. (Nakieru, 1985).

There are, however, differences between the retention of students in distance learning versus traditional class settings. Some recent programs have reported dropout rates of up to 80% (Perraton, 1991). Even among the best distance learning programs, such as the Open University, only about 50 to 60% of distance students actually graduate. "This is much lower than the 80-90 per cent achieved by full-time students but is probably comparable to that of other part-time students" (Perraton, 1991, p. 2).

With the rapid expansion of competing distance learning options, students now have a growing number of choices of which classes to take and which programs should be continued. These choices raise inevitable questions concerning what factors help determine students' willingness to initiate and complete programs. In particular, this raises fundamental questions over what factors predict distance learning students' perceptions of instructional effectiveness and students' satisfaction with their classes.

Perceptions of and Satisfaction with Distance Learning Classes

Previous studies point to a number of educational features, technological innovations and personal characteristics that may predict students' perceptions of and satisfaction with distance learning classes. The following sections introduce these predictor variables. A series of hypotheses are then proposed along with conditions that may affect these relationships.

Student-Teacher Interaction

Student isolation is a potential problem in any learning environment. Isolation especially is a threat to the success of distance students. Student-teacher interaction and feedback are frequently mentioned as distinguishing features of successful educational programs (Bates, 1984). Whether the interaction and feedback are immediate during the class or in subsequent discussions, the nature and frequency of student-teacher interaction have been found to be important to effectiveness (Feldman, 1989).

Student-Material Interactions

In addition to isolation, student boredom is a threat to learning. This threat can be magnified when resources are largely centered on materials (Perraton, 1991). The introduction of interactive technologies further complicates and augments the potential for student-material interactions. In the case of distance learning, instructional designers pay particular attention to the quality of the resource materials, the technologies and the degree to which students can interact with these elements.

Access to Technology

Access to technology is both a social equity policy problem, and factor that can limit the effectiveness of distance learning (Bates, 1995; Cybela, 1996). In order to make materials more available and interactive, instructional designers have turned to the Internet, satellite, cable, CD-ROMs, and forms of video conferencing. The availability and convenience of these technologies plays a growing role.

Perceived Quality

Perraton (1991) argues that that quality is of utmost importance to distance education, stressing that it must be monitored to ensure effectiveness. Others note that materials for distance learning courses are typically of better quality, more motivating and more interesting than those used in traditional classroom environments (Bates, 1984; Perraton, 1991). Since the proliferation of the Internet, quality is not as much an issue except with streaming video and other technologies that require higher bandwidth.

Prior Experience

Students bring their prior experiences to the learning setting. In traditional education, students' backgrounds have often been tested as potential biases in students' evaluations of their educational experiences (Marsh, 1984). While little research has been conducted in this area, it seems logical that students' prior experiences with distance learning will likewise influence their perceptions of and satisfaction with distance learning classes.

Technological Levels

Students' comfort with technologies is a final factor that represents a condition that can influence perceptions of and satisfaction with distance learning. Gehlauf, Shatz and Frye (1991) discuss the issues of anxiety and comfort with technology. They further discuss the role that training can play in helping individuals become comfortable with technology. As educational programs increasing involve new electronic innovations, it is important to understand the role that students' technological levels and comfort with technologies play in creating conditions where distance learning may or may not be successful.

Propositions and Research Questions

Based upon the previous literature and current issues facing distance learning, this study examined four research propositions.

H1 Student perceptions of instructional effectiveness are positive functions of:
- student interaction with instructors
- student interaction with instructional materials
- student access to technologies
- the perceived quality of instructional media utilized.

H1a The relationship among these four predictors and perceived instructional effectiveness will be greater in distance learning environments compared to traditional learning environments.

H1b The relationship among these four predictors and perceived effectiveness will be greater for students who are more technologically advanced than for students who are not as comfortable with technology.

H2 Student satisfaction with distance education is a positive function of:
- student interaction with instructors
- student access to technologies
- the perceived quality of instructional media utilized
- prior experience in distance learning environments.

H2a The relationship among these four predictors and student satisfaction will be greater in distance learning environments compared to traditional learning environments.

H2b The relationship among these four predictors and satisfaction will be greater for students who are more technologically advanced than for those students who are not as comfortable with technology.

In addition to the research propositions, three research questions were tested. The research questions were:
1. Is there a relationship between student age and the criterion variables?
2. Is there a relationship between student sex (gender) and the criterion variables?
3. Is there a relationship between student education levels and the criterion variables?

Each of these questions was examined in the overall and conditional analyses.

Methods

Data were collected in 1996 from eight higher educational institutions in Florida. The institutions employed a variety of technologies. Several of the participating educational institutions had classes that merged both traditional and distance learning students. In other classes, there were only distance students. Students responded to questionnaires via mail, facsimile, or electronic mail. The questionnaires were adapted from Bolduc (1993), with changes made to reflect the nature of this study. A total of 253 students participated in this study --- 174 distance learning students and 79 traditional students.

Cronbach Alpha analyses indicated that the reliability of the items in this study ranged from .70 to .87. Only the student-teacher interaction variable (Alpha = .70) fell below the traditional criterion level of .80. Multiple regression and conditional regression analyses were used to test the research propositions and questions. One-tailed tests were calculated where a direction was predicted. Since the research questions involving personal characteristics did not predict directions, two-tailed significance levels were calculated.

Results

The predictor variables in this study were student-teacher interaction, student-material interaction, access to technology, perceived quality of instructional media, and prior student experience with distance courses. In addition, age, sex, and highest degree completed were used as predictor variables.

Perceived Instructional Effectiveness

Multiple regression analysis was initially used to predict perceived instructional effectiveness and student satisfaction levels. The data indicated that when using the combination of educational and media factors, and personal characteristics, a significant positive relationship (= .254) was found between student-teacher interaction and perceptions of instructional effectiveness. The same pattern was found when using perceptions of media quality to predict levels of instructional effectiveness (= .332). There was also a significant positive relationship with students' highest degree completed (= .177). Student - material interaction, access to new technologies, age and sex were not significant predictors of perceived instructional effectiveness. The overall multiple correlation for the criterion and predictor variables was .532, with an adjusted R2 = .242 (p = .000).

Predicting Instructional Effectiveness - Distance vs. Traditional Students

The sample group was divided into traditional and distance students. Interestingly, when predicting perceived instructional effectiveness among traditional students, none of the predictor variables was found to be statistically significant. Among distance students, there was a significant positive relationship (= .260) between perceptions of student -teacher interaction and perceptions of instructional effectiveness. A comparable pattern was found when using perceptions of quality to predict instructional effectiveness (= .375). The remaining factors and characteristics were not statistically significant. In the total model among distance students, there was a R = .487, with an adjusted R2 = .163 (p = .005).

Predicting Perceived Instructional Effectiveness - Technological Level of Students

Respondents additionally answered questions related to their use of various technologies. A median split was calculated to create conditions of more versus less technologically advanced students.

When looking at the data on technologically advanced students, there was a significant positive relationship (= .499) between student -teacher interaction and perceptions of effectiveness. Again, perceived media quality was also positively correlated (= .265). There were no statistically significant predictors between the personal characteristics variables and perceived instructional effectiveness. The overall multiple correlation for the predictor variables was R = .660, adjusted R2 = .351 (p = .000).

Among less technologically advanced students, there was a significant positive relationship (= .209) between student-teacher interaction and perceptions of effectiveness. Once again, the same pattern was found for media quality (= .287). The overall R was .521, with an adjusted R2 = .177 (p = .012).

Student Satisfaction

In addition to effectiveness, student satisfaction levels were measured and multiple regression was used to analyze the data. When a combination of educational factors and personal characteristics was use,d a significant positive relationship (= .201) was found between student -teacher interaction and student satisfaction. Perceptions of media quality were also positively related to student satisfaction (= .415). None of the other educational factors or personal characteristics was statistically significant. The overall multiple correlation for the predictor variables was .536, adjusted R2 = .247 (p = .000).

Predicting Student Satisfaction - Distance vs. Traditional Students

As with perceived effectiveness, the sample group was divided into traditional and distance students to predict satisfaction. Consistent with the findings of effectiveness, when predicting satisfaction among traditional students, no educational factors or personal characteristics were statistically significant.

Among distance students, there was a significant positive relationship (= .246) between perceptions of student-teacher interaction and student satisfaction. A similar relationship was found when using perceptions of technical quality to predict student satisfaction (= .517). The remaining educational factors and personal characteristics were non-significant. In the total model predicting student satisfaction, the educational factors and personal characteristics were correlated R = .557, adjusted R2 = .244 (p = .000).

Predicting Student Satisfaction - Technological Level of Students

A median split was used to categorize technologically advanced and less technologically advanced students. Among technologically advanced students, there was a significant positive relationship (= .267) between student-teacher interaction and student satisfaction. A positive relationship also existed for perceived media quality (= .390). There was a significant negative relationship (= -.265) between the age of students and their reported satisfaction levels. Older technologically advanced students reported less satisfaction with their classes. The overall multiple correlation for the predictor variables was .650, with an adjusted R2 = .341 (p = .000).

Among less technologically advanced students, there was a significant positive relationship (= .361) between perceptions of media quality and student satisfaction. With personal characteristics, the highest degree completed was positively related to levels of student satisfaction (= .264). The remaining educational factors and personal characteristics were non-significant. Considering the total model predicting satisfaction among less technologically advanced students, the educational factors and personal characteristics were correlated R = .518, adjusted R2 = .172 (p = .015).

Conclusions

Distance learning is a tremendously important issue in today's world. This study evaluated how host (traditional) and remote (distance learning) students perceive the effectiveness of their instruction and their satisfaction with instruction. The findings of this study revealed that student-teacher interaction and perceived media quality are consistent positive predictors of student perceptions of instructional effectiveness and student satisfaction. These predictor variables were particularly important for distance students. Student-teacher interaction and perceived media quality are consistent positive predictors of student perceptions of instructional effectiveness for both technologically advanced and technologically less advanced students. When predicting student satisfaction, student-teacher interaction and perceived media quality are consistent positive predictors only among technologically advanced students. However, when predicting satisfaction among less technologically advanced students, only perceived media quality is significant. Finally, while not hypothesized, the means and standard deviations revealed that distance (remote) students indicated less student satisfaction and perceived instructional effectiveness than traditional (host) students. These differences were statistically significant using two-tailed t-tests.

The findings of this study are generally consistent among variables of instructional effectiveness and student satisfaction. This research shows that despite all of the studies that have concluded that there are "no significant differences" between effectiveness of traditional and distance learning, there are differences in the variables that predict traditional and distance learning students' s perceptions of instructional quality and their satisfaction with their instruction. There are many variables that need to be taken into account, but this study does suggest that in, distance learning, there must be a focus on media quality and interaction between students and the instructor.

There still are many questions that remain unanswered that could lead to beneficial research topics. For example, among distance learning students, to what extent can we anticipate class completion and program graduation using student-teacher interaction, perceived quality, perceived instructional effectiveness, student satisfaction as predictors? To what extend can we enhance these predictors (through motivation factors, self-efficacy, etc.) to promote learning, graduation, and increased satisfaction among distance learners? These are fundamental questions that distance learning researchers should help answer.

References

Bates, A.W. (1984). The Role of Technology in Distance Education. London: Croom Helm, Ltd.

Bates, A.W. (1995). Technology, Open Learning and Distance Education. London: Routledge.

Bolduc, William James (1993). The Diffusion of Digital Compressed Video-Interactive in a University Environment-1988- 1992: A Case Study. Unpublished doctoral dissertation, Florida State University.

Burnham, Byron R. and Seamons, R. Alan (1987). Exploring the landscape of electronic distance education. Lifelong learning: An omnibus of practice and research, 2(2), 8-11.

Cybela, Joan E. (1996, March 7). Quality Learning Through Distance Education. Concurrent session at Intercom 96 Distance Learning Conference, Florida International University, Miami.

Feldman, Kenneth A. (1989). The Association Between Student Ratings of Specific Ratings of Specific Instructional Dimensions and Student Achievement: Refining and Extending the Synthesis of Data from Multisection Validity Studies. Research in Higher Education, 30(6), 583 - 645.

Garrison, D. R. (1989). Understanding Distance Education: A Framework for the Future. London and New York: Routledge.

Gehlauf, DeeAnn N., Shatz, Mark A., & Frye, Tim W. (1991). Faculty Perceptions of Interactive Television Instructional Strategies: Implications for Training. The American Journal of Distance Education. 5(3), 20-27.

Gessner, Quentin H. (1987). Handbook on Continuing Higher Education. New York: Macmillan Publishing Company.

Holmberg, Borje (1986). Growth and Structure of Distance Education. London: Croom Helm.

Nakireru, Alexander Omoviekovwa (1992). The Development of Instructional Television in American Higher Education. Ann Arbor, Michigan: University Microfilms International.

Perraton, Hillary (1991, September). Administrative Structures for Distance Education. London, England: Commonwealth Secretariat and The Commonwealth of Learning.

Sukow, Randy (1992, November 30, v122, n49). Government or Business: The Developing Battle Over Who Takes the Lead in Distance Learning. Broadcasting & Cable, p. 42.

Tait, Alan (1991). Distance Education in the United Kingdom Today: Current Trends. The American Journal of Distance Education, 5(3), 42-46.

Zigerell, James (1991). The Uses of Television in American Higher Education. New York: Praeger Publishers.

Online Personal Learning in Teacher Preparation

David Gibson
The National Institute for Community Innovations
United States
dgibson@nici-mc2.org

Abstract: Work by the National Institute for Community Innovations (NICI at http://nici-mc2.org) is leading to new web-based tools for enhancing preservice education and supporting increase use of technology, especially in Professional Development Schools. One of the tools, the NICI Online Personal Learning Plan (PLP) for preservice students, is intended to assist learners through the processes of: 1) Self-assessment of strengths, interests and aspirations; 2) Planning preservice education learning goals and projects; 3) Linking goals and projects to valued outcome standards, 4) Creating original work and sharing the work with others; 5) Receiving high quality feedback for the improvement of their work; 6) Documenting and validating the achievement of learning goals; and 7) Assisting in the selection and preparation of exhibits of learning. This paper discusses the roots and rationale of the project, and presents some of the details of the thinking that is guiding the web-tool development.

Groundwork and Rationale

The lineage of the NICI Online Personal Learning Plan comes from two sources. One source is a bold move by a local secondary school community in Montpelier, Vermont that in 1993 placed "individualized educational plans for every student" in their long term strategic plan (Gibson & Clarke 1999). This led, in 1995, to the creation and implementation of a school-wide program to place personal learning at the center of a continuous conversation involving all students, their parents or guardians, and caring adults in a school. Support for the school-based development came from the University of Vermont. In addition, early in its development, the concept of the Montpelier "PLP" was picked up by the Regional Laboratory at Brown University, and combined with similar movements and interests in Rhode Island, Maine, Massachusetts and other New England states. In Maine, for example, the concept of personal learning took on a primary role in that state's new proposal for the reform of secondary schools. In other work of the Lab, the theme of personalization became a crucial feature of the secondary reform network in the region, and was tied to the principles of "Breaking Ranks," the reform monograph of the National Association of Secondary School Principals. Thus, the concept of personalization of learning as essential to educational reform is well-founded in theory as well as practice.

The other source is the pioneering work of the WEB Project, which makes available web-tools and networked communities for original student work to be shared and critiqued online. The WEB Project successfully brings together working professionals and classroom teachers in support of the improvement of student work by focusing high quality feedback to a learner based on their articulated intentions for their work. The secrets of success of the project are probably many, but it is worth pointing out the learner-centered nature of the online dialogs and the singular focus on creation of original work. Also, the entire sequence of activity in the project only begins if and when a student shares a work-in-progress and asks for specific feedback. These qualities of learner-centeredness, creativity, self-initiative and intellectual focus have been carried forward into the web-based PLP.

The rationale for building a web-based tool focused on the improvement of preservice teacher work has two parts. First, there is a need for feedback to come from a diverse audience, yet preservice and induction programs sometimes have limited resources and structures that produce scant feedback to aspiring teachers. As a result, an aspiring teacher's work evolves in isolation, perpetuating the general conditions of teaching present in most schools today. A web-based professional network can help overcome isolation, but even more important, it can provide the future teacher with high quality information that might not otherwise be available. The advantages of "anytime, anyplace" access to experts is an obvious benefit of a web-tool.

The second rationale is that there is a need for effective documentation of learning beyond paper and pencil formats. Ideally, documentation should be a record of the decisions as well as the validation of the work produced. In small personalized programs, preservice teachers benefit from many interviews and observation/feedback sessions related to their work, but in many programs, that experience is limited to the last few months of preparation. An online personal learning plan can help create a longitudinal multimedia record of growth and change in an aspiring teacher's skills and capabilities

The sources of inspiration and rationale led us to ask "What does preservice teacher work look like?" "What would happen if we could build a site for the improvement of a future teacher's work?" "Could the principles of personalization and helpful feedback in a professional network assist teacher education programs?" The online Personal Learning Plan is a way to pose answers to these kinds of questions.

Critical Components in the Online Personal Learning Plan

Online learning is here to stay. It brings remote resources to the desktop anytime, anyplace. Yes, it is in its infancy, and lacks many important features needed for rich human communication, but so in their own way do writing, film, video, and talking. Using the new online communication tools for learning is a matter of integration and balance and their effectiveness depends on the attributes of both the learner and teacher. The Online PLP promotes a uniquely learner-centered approach to the challenge of integration and balance of technology in learning. The following basic assumptions guide the thinking behind the NICI - PLP.

Face-to-Face as a Foundation of Learning The online world is an extension of human contact. The Online PLP does not and cannot replace face-to-face contact needed for learning.

Three bases for planning and action for learning The purposes of learning can be categorized by three domains:

1. Institutional priorities – our shared community goals
2. Professional priorities – our scholarly traditions and expectations
3. Personal priorities – our source of deep meaning

The Learning Cycle The Online PLP can be a powerful extension and helpmate in the "action research" process of planning, doing, reflecting and consolidating knowledge.

Focus on the learner's work The learner's productivity and self-efficacy is the ultimate goal of the Online PLP. Work samples are the critical source for evidence of learning, the documentation of progress, and the verification that high standards have been achieved.

Self-Direction and Making Meaning Learners produce better and are more highly motivated the more they have decision-making power over their learning. Learners gain from posing questions to advisors, and from knowing about, developing and using a variety of learning assets - their strengths, interests, aspirations, community and personal resources. All learning is a matter of making personal meaning out of the alternatives presented in experience.

Flexible Thinking Tools Learners gain from scaffolding and assistance in stages and types of thinking, for example, divergent thinking, using multiple frameworks and perspectives, and so forth.

Two Initial Versions of the PLP

The Online PLP is being developed in two versions (Figure 1): one for 9-12 students and one for educators in preservice, inservice and higher education roles. The underlying structure of the PLP is similar for both audiences. At its heart, the purposes of learning fall into three primary categories.

A first set of purposes is determined by the larger societal and community goals for education. A high school student, for example, is expected to be a literate member of the community, who makes a living, votes, and contributes in other ways to community life. An educator is expected to also be a contributing member of a community, especially a school community, who in addition, has attained a license to teach, and is continually upgrading their professional knowledge and skills. This is the domain of social and institutional goals and expectations. In the Online PLP, learners find the basic social and institutional expectations that are appropriate to their setting, and are prompted to use those expectations when they set goals in this domain.

A second set of purposes is determined by the academic and professional standards that need to be mastered in order to advance and to complete the program goals of high school graduation, licensing for teaching, advanced certificates and degrees, and for continuous learning. High school students, for example, increasingly have to demonstrate mastery of a number of standards that have been defined by their states, districts and schools. Preservice educators, especially in Professional Development Schools such as those in the

NICI Virtual Professional Development School Consortium (http://nici-mc2.org/pgs/highed/hevpds.htm) work on portfolios of evidence. Most teachers in the field work on some sort of continuing education plan, and many of those plans make connections to their school's long range plan. Highly experienced teachers assemble collections of evidence for National Board Certification (http://www.nbpts.org/nbpts/) and then engage with peers in reflecting on and evaluating their work.

The third set of purposes is one that has been overlooked too often by schools and the professional development process: personal goals. Not all students are routinely asked to think about their strengths, interests and aspirations when making educational decisions. Schools do not routinely make adjustments in what they offer based on what students most dearly want to learn. Likewise, the professional development experiences of most teachers - future, present, and past - have not been designed with personal goals in mind. However, it is well known that doing so increases motivation, productivity, affiliation and loyalty (Costa 1999 ;Friedrichs 2000). The Online PLP is built around this basic theory as a starting point for purposeful learning.

9-12 Student	Preservice & Inservice Educators & Teacher Education Faculty
Social/Community Goals	Institutional Priorities
Academic Standards	Professional Standards
Personal Learning Aspirations	Personal Learning Aspirations

Figure 1: Two versions of PLP with similar goal domains.

Example Questions Prompted by the Online PLP

The Online PLP begins the process of goal planning by surveying the learner and engaging the learner in activities that help explore the three domains of purpose as well as areas of strength, interest and aspirations for the future. Questions prompt writing and thinking, which is entered into an online form that then becomes available for editing, sharing privately with advisors, and for honing into long and short term goals. As the learner nears the goal-setting stage, the questions begin to focus specifically within the domains, by asking the learner to make their ideas relevant to learning.

For example, in the educator version, the following questions are asked. Pull-down menus present national and state standards, program requirements, and lists constructed from the earlier self-assessment surveys and activities. Goals become clearer as the learner and advisors dialog about questions such as:

Institutional Priorities What are my institution's priorities for improving student results? What are the skills and knowledge I should strengthen in order to best contribute to my institution's goals for improving student results?

Professional Standards On what standards do I want to demonstrate mastery? What are the skills and knowledge I need to strengthen in order to be able to demonstrate mastery of these standards?

Personal Learning Aspirations What are the skills and knowledge areas I most want to master for my own personal development?

The answers to these kinds of questions are then used to construct an action plan to move the learner from the idea stage to the achievement of valued outcomes.

Structure of the Online PLP

The online Personal Learning Plan will allow all media formats and a multiplicity of linkages among learning goals, projects, and the evidence of attainment of standards of performance. Distinct from electronic portfolios that concentrate on the presentation and storage of completed work, the PLP concentrates on the improvement of work and the documentation of change of work over time.

Three user levels and a server administrator level are provided. Users levels include the Learner, Advisors, and a Program Administrator. The Learner is in charge of their PLP. He or she creates or chooses goals, links them to standards or other external sources, creates work that stands in relationship to the goals, makes decisions on when both goals and work will be shared with advisors, and decides when work and goals are to be archived into permanent storage.

Advisors are associated with one or more learners. When a learner's goal or work is being shared for critique and feedback, the Advisor can discuss, offer direct edits or validate the goal or work as adequate for its purpose. For example, a goal might be validated as appropriate to completion of a secondary teaching license in science; a piece of work might be validated as evidence of achieving a standard of performance linked to one or more goals. The validation process can be formalized with rubrics or left as narrative, and any rubric can be associated with any piece of work's link as evidence.

The Program Administrator can review all Learners and Advisor records, add and delete Learners and Advisors, set defaults on the number of advisors that need to agree in order for validation to be complete, create rubrics, create and edit standards, and make other selections associated with program management.

The Server Administrator controls the hardware and communication decisions needed for site maintenance and archiving.

Tools for the Learner

In what follows (Figure 2), the basic tool sets available to the learner are described, organized first by the section name, then by the specific tool available, followed by a description of the tool's primary function.

Section Name	Specific Tools Available	Description of the page loaded by the link
Home		
	Edit	Displays splash page where Learners can place personal pictures, display their address and email, publish a "motto/quote/theme" The page can become a jacket of CD or title page of printed portfolio if desired.
Getting Started		
	What is a PLP?	Displays (PLP admin editable html) pages that inform the learner about the personal learning planning process.
	How Online PLP works	Displays (PLP admin editable html) pages that inform the learner about the personal learning planning process.
	What you need to begin	Displays (PLP admin editable html) pages that inform the learner about the personal learning planning process.
Planning		
	My Personal Strengths & Interests	Displays a set of online survey forms that help the learner explore his or her strengths, interests and aspirations in three dimensions (academic, social and personal). After a learner takes a survey, the results are available for editing and copying into other forms. Results are also available to Advisors at the learner's choice of displaying them.
	Social and Institutional Goals	Allows PLP Administrator to pre-load (or Learner to upload social/institutional program goals or priorities. (e.g. Educator question: What are my institution's priorities for improving student results?)
	Academic (Professional, Licensing) Standards	Allows PLP Administrator to pre-load load (or Learner to upload) content and performance standards.
	Community Assets	Allows PLP Administrator to pre-load community contacts, program standards, Virtual library link and other resources.

		If desired by PLP admin, automatically links learner to advisors with similar interests by comparing with survey results from the above section. Allows a learner to add records for new community contacts and advisors. PLP admin can choose to moderate new resources requested for addition, or a private database can be set up by the learner that does not link with or add to the PLP admin community asset database.
	Generating Options	Displays a set of online activities that help a learner organize and prioritize their options. Results are available to Advisors and Learner at the learner's choice of displaying them.
	My Goals With Comments Status	Learner creates goal. If desired, Learner and Advisor make links between goals and external standards/institutional priorities in Academic (discipline), Social (professional/licensing) and Personal Growth. The "Status" view displays progress toward completion via a rubric.
	My Projects With Comments Status	Allows renaming a goal as a "Project" keeps all programming as above for My Goals

Creating		
	New Works	Provides help in the creation process via online tools for brainstorming, selecting ideas, making connections, making decisions about documentation, choosing media to use.
	My Works in Progress With Comments Status	Shows a view of only unapproved works and goals.

Reflecting		
	Works Completed	Shows a view of only approved/completed works and goals.
	What Have I Learned?	Displays a help page on reflecting on work accomplished, how to select examples, add commentary. Survey for suggestions for improving the learning environment. (What would help me next time, What I needed that I didn't have access to, What the organization could do to help me next time.)
	Selecting Examples for Exhibition	Prompts learner to prioritize their work, then select the most salient example that represents the desired goal or standard, builds a list of "selected" and "to be archived now" works. Can display by standard, by goal and by work.
	Adding Commentary	Allows an introductory remark or summary to be added to a selected work(s) for display.

Exhibiting		
	Prepare an Exhibition	Displays all goals and work that have completed reflection section; archives all other goal and work that were selected.
	Type of Portfolio	Assists learners to select and then use preformatted displays for work - text presentation, online with hyperlinks
	Make a Slide Show	Assists learners with multimedia presentation decisions and prepares materials for a CD permanent storage.
	Archive	Assists learner in archiving material onto a local or remote

	Send to Location Send to CD	hard drive, or sending a CD prep file for CD burning.

Discussions		
	My Advisors	Displays advisors' names and contact information, email link, link to personal profile page of each advisor. Needs a request form for learner to add an advisor/reviewer, approved by PLP Admin.
	My Subscriptions	Displays all works-in-progress that have been selected for email notification.
	General Discussion	Displays a private discussion space for Learner and Advisors for "other" conversations not directly related to a specific goal or work.

Admin		
	Preferences	Displays all editable settings of the PLP for the Learner

Figure 2: Tools in the Online PLP

References

Costa, A. (1999). Adapted from opening remarks at the December, 1999 NSDC conference.
Friedrichs, A. (2000) Dialogue, discourse and learning. Unpublished dissertation. University of Vermont.
Gibson, D. & Clarke, J. (1999). Growing towards systemic change. Providence, RI: The Regional Laboratory.

Developing Standards of Quality for Online Courses

Kendall Hartley, Terresa Gibney, David Heflich & Neal Strudler
Department of Curriculum and Instruction
University of Nevada, Las Vegas
United States
khartley@nevada.edu

Abstract: This paper will report on the development of a "Standards of Quality" document for educational technology distance learning courses. This project resulted from a concern that the courses were viewed as less rigorous by other faculty and our own desire to insure quality in current and future course offerings.

Introduction

This paper will describe a project completed by the Educational Computing and Technology group at the University of Nevada, Las Vegas. The goal of the project was to develop "Standards of Quality" for distance education courses offered in a masters degree program. The impetus to the project was a concern for maintaining a quality graduate program as on-campus courses were beginning to be offered as online courses. Distance education courses are often viewed as suspect by faculty unfamiliar with its opportunities and record of success. By developing this framework, we hoped to demonstrate why these courses should be considered of equal (or greater) quality when compared to the on-campus courses. Through this project, we hoped to develop a document that was a) based on current research b) could provide guidance for new course development and c) provided a framework for evaluating current course offerings.

A literature review was initially conducted to help guide the project. Each of the four participants conducted an independent search of the literature to identify four or five publications that "provided useful insight into the design and delivery of quality distance education courses." This approach to reviewing the literature insured a diverse group of publications would result. Once the pertinent publications were identified, a copy of each was shared with the group for review. Subsequent meetings would delineate major themes from the readings that would guide the development of the "standards of quality" document. This document would then be used as a tool to review existing courses and guide further course development.

Results

The search resulted in 23 articles, chapters and guidelines that were reviewed by each member of the group. As hoped, the articles represented a very diverse group of publications that ranged from guidelines such as NCATE standards (2000) to guidelines for online courses (e.g., Palloff and Pratt, 1999) and even a chapter from Dick and Carey's Systematic Design of Instruction (1996). From this review and subsequent discussion, four major themes were identified as crucial to the delivery of a quality course. Themes identified included, interactivity/collaboration, clear expectations, design and evaluation.

Interactivity / Collaboration

It was clear from the literature and our discussions that interactivity and collaboration were crucial to components of any course. To accomplish this in distance learning courses, activities need to be designed with collaboration in mind. Individual activities can certainly play a role but if the entire course is comprised of individual activities, a sense of isolation will detract from the quality of the course (Gilbert & Moore, 1998; Mioduser et al. 1999; Paloff & Pratt, 1999).

Clarity of Student Expectations

It is vital that students understand what is expected of them from the very beginning of the course. Face-to-face courses normally inform students of expectations in terms of assignments and maybe outside time commitments, but distance learning courses require that expectations be delineated in much greater detail. What the student can expect from the instructor should also be clearly communicated. Students may expect emails to be replied to as quickly as they get responses in the face-to-face classroom. This isn't reasonable in a distance-learning course. However, a quick response is important and the instructor should let students know how quickly they can expect a reply to inquiries and feedback on assignments. We also feel that outcome expectations should be made clear. We have followed the NCATE (2000) framework for describing course outcomes. Each course will delineate the skills, knowledge and dispositions that should result from the class activities.

Design

As we become more dependent on computer based tools such as WebCT and our own Websites for the distribution of course materials, communication with students and presentation of content, we must also become more cognizant of design issues. Consistency between and within courses will help our students tremendously (Hall, 1999).

Evaluation

In light of these activities we have also become more cognizant of the need to regularly and systematically evaluate our courses. As we put our courses online, we have a much easier mechanism for evaluating and comparing courses than we did previously be simply reviewing syllabi. It was clear from our discussions that a systematic review of objectives, activities and assessments of all of our courses would improve the quality of our offerings (Dick & Carey, 1996; Jones & Paolucci, 1999).

Discussion

Although the focus was initially on courses that were primarily distance education courses, it was soon expanded to include all of our course offerings. This was necessitated by the difficulty in delineating between distance education courses, hybrid courses and face-to-face courses. Our discussion on the distinctions led to the realization that all of our courses are to some extent hybrid courses. In other words, each of our courses have at least some expectations for distance learning activities (e.g., bulletin board postings) and face-to-face activities (even distance courses have at least an introductory f2f session).

We found the work on the project to be as valuable as the product. The dialogue between the faculty members was lively and substantive. It became a wonderful way to clarify what our goals were for the program. In many ways, distance education and new technologies have given us reason to rethink our expectations and approach to a graduate program in Educational Computing and Technology. A final conclusion was the need to institutionalize this process. In effect, we knew that much of what we had discussed would change over time. Students' needs would change. The needs of schools would change. And certainly, the technologies available would change. Therefore, rather than viewing this as a project with a beginning and end, we concluded that the development and revision of our Standards of Quality document would continue indefinitely.

References:

Dick, W. & Carey, L. (1996). The Systematic Design of Instruction. New York: Harper Collins.

Gilbert, L. & Moore, D. R. (1998). Building interactivity into Web courses: Tools for social and instructional interaction, 38(3), 29-35.

Hall, R. H. (1999). Instructional Web site design principles. Virtual University Journal, 2.

Jones, H. T., & Paolucci, R. (1999). Research framework and dimensions for evaluating the effectiveness of educational technology systems on learning outcomes. Journal of Research on Computing in Education. 32, (17-27).

Mioduser, D., Nachmias, R., Lahav, O., & Oren, A. (2000). Web-based learning environments: Current pedagogical and technological state. Journal of Research on Computing in Education. 33, 55-76.

NCATE 2000 Unit Standards. (2000, May 11). Washington, DC: National Council for Accreditation of Teacher Education. Retrieved October 10, 2000 from the World Wide Web: http://www.ncate.org/standard/m_stds.htm

Palloff, R. M. & Pratt, K. (1999). Building learning communities in cyberspace: Effective strategies for the online classroom. San Francisco, CA : Jossey-Bass.

Acknowledgements

These activities were funded in part by a grant from the Nevada Gaming Foundation to support the increased access of teachers to educational opportunities on the uses of technology in the classroom.

Reflections of Reality: Online Conversation in a Teacher Education Seminar

David A. Heflich
Department of Curricilum & Instruction
University of Nevada, Las Vegas
dheflich@ccmail.nevada.edu
and
LeAnn Putney
Department of Educational Psychology
University of Nevada, Las Vegas
putneyl@nevada.edu

Abstract: The use of seminars in teacher education have often been used to stimulate reflective thought and moral development among the participants. The use of online resources, listservs and electronic mail, exapnd the scope and range of seminars by allowing students to participate at any time. This study examines the use of an online seminar with a cohort of students involved in a field-based practicum at a Professinal Development School (PDS) on the university campus. The methodology of the seminar is explored as are the topics discussed by participants. Particular attention is given to the ways in which student attitudes develop during the conversation.

Introduction

We have all experienced in-depth conversations that stay with us over time. Such conversations turn over in our minds as we relate what was said to our own experience. Conversations that lead us to rethink what was said and provoke us to make meaning from our own perspective can be termed reflective, and often lead to changes in thinking or practice. In extraordinary situations, such reflective conversations can result in changes in our beliefs (Mezirow, 1990; Schon, 1987). Such conversations have the potential to become valuable, memorable experiences because they enable us to grow, both emotionally and intellectually.

In this article we consider different aspects of reflective conversation, it's occurrence online in the form of electronic mail messages, it's role in stimulating professional thought, and it's use as a methodology in teacher education. We portray a research study conducted in 1999 that explored the impact of online technology with preservice teachers who were participating in a practicum seminar. In particular, we explore the way that protected conversational space offered by computer-mediated communication (CMC) allowed for a unique form of conversation to take place between participants. In this case, the participants explored issues in more depth than they might otherwise have done in face-to-face encounters.

CMC has been discussed as a useful tool for teaching and learning. Used as a tool for online communication, CMC has been credited with helping teachers move to more constructivist teaching practices than previously held (Heflich, 1998). An important aspect of this movement is the extent to which CMC can stimulate discourse that leads to reflection by the participants. CMC discussion groups have been used in preservice teacher education to help develop reflective thought (McIntyre & Tlusty, 1995) ,the moral development of preservice teachers (Harrington, 1992), and general knowledge building discourse that enhances education (Scardamalia & Bereiter, 1996).

Central to all of these efforts is the significance of the protected conversational space that is offered by CMC. Online conversation has previously been characterized as reflective (Heflich, 1997). For our purposes, reflective conversation is an exchange among participants in which the expression and receipt of ideas leads to the construction of new understanding of their own experience. Bamberger (1991) has described such an exchange as "conceptual chaining" in which ideas are articulated, exchanged, recreated and re-exchanged as they move from person to person in a conversation. The reflective aspect of such a chain is the way in which individuals capture the ideas that are being exchanged to construct their own meaning from them as they reflectively integrate the new ideas with previously held knowledge.

Schon (1987) speaks of three forms of reflective thought. Reflection-on-action occurs as one seeks to make meaning of events that have occurred. One may reflect-in-action while confronting a problematic situation, and constructing a solution. Conversation offers us an opportunity to reflect-on-action, as it allows us to discuss and process into our intuitive knowledge base (Iran-Nejad, 1994) things that have previously occurred. It can also involve reflection-in-action as we dynamically engage in conceptual chaining (Bamberger, 1991) in the midst of an ongoing dialogue. The third form, reflection-for-action, indicates that the participation in the reflection process serves as a guide for taking future action. From this view, the potential exists for conversation to serve as a vehicle for stimulating reflective thought and may lead to both personal and professional growth.

Reflective thought has long been considered an important aspect of professional growth. Argyris and Schon (1974) identified the contradiction between one's espoused theory, one's expressed beliefs, and one's theory-in-use, beliefs made evident by one's activity. Growth for Argyris and Schon (1974) occurred when one recognized the dissonance between one's espoused theory and theory-in-use and took steps to align them. It is inquiry among individuals that helps expose the contradictions between beliefs and practices of teachers. Feldman et al. (1996) argue that teachers in a reflective stance examine their own practice exposing and questioning tacit assumptions about their teaching. This allows them to reflectively evaluate past practices and seek alternatives for future practice.

The Project

The research reported here discusses an effort to explore the impact of exposing preservice teachers to teaching with technology. The thought that teachers teach as they were taught has become conventional wisdom since Lortie articulated the idea in 1975. It is one of the many ideas that fuel the current effort to infuse technology into teacher education, symbolized most recently by the Federal Department of Education's Preparing Tomorrows' Teachers to Teach with Technology program (U.S.Government, Department of Education, 1999). Computer use in K-12 education is at an all-time high. A recent study by Becker and colleagues (1999) indicates that more teachers than ever are using the Internet in their practice, and furthermore that there appears to be a correlation between teachers' use of the Internet and the way they teach. Access to technology is one factor affecting teacher use of technology. Another is the extent to which preservice teachers are exposed to technology use within their classes and in field placements. This project was an attempt to infuse computer-based technology into preservice teacher education. In this study we examined the use CMC as a way of encouraging members of a field placement practicum seminar to explore their experiences reflectively and to discuss those experiences with other members of the seminar.

Online Seminars

The idea of using CMC to foster critical, reflective thought among preservice teachers in field-based settings was first described by Harrington (1992). Students involved in their preservice student teaching seminar were asked to pose a reflective question to a listserv discussion group composed of members of the seminar. Harrington (1992) found that the discussion in these virtual seminars was critically reflective, and led to the moral development of preservice teachers. In the case of our study, the purpose of the online discussion was the further exploration of concepts and ideas that the preservice teachers were learning through their other courses, and their experiences in the classroom. Since they had participated in a seminar the semester before that was held in a regular classroom, these preservice teachers were already familiar with the seminar-as- forum for discussion format. The difference was that this time the discussions would take place online rather than in a face-to-face classroom setting.

The Professional Development School and the PDS Cohort

The venue in which the project occurred has its beginnings in the creation of a Professional Development School (PDS) and the resulting teacher education program embedded within it. The PDS is a joint venture between the university and the school district to better prepare preservice teachers to teach in schools with students who may be considered to be at-risk, and to provide teachers in the PDS with the support and resources of the College of Education (COE). Teacher preparation in this PDS model is conceived of as a cohort of undergraduate students, who together would engage in an integrated curriculum taught by a team of COE faculty and the faculty and staff of the PDS. The curriculum is enacted both in the classroom and through the heightened participation of the cohort in the day-to-day life of the PDS.

Cohort Culture

In discussing the culture of the cohort, we are using a localized notion of culture (Collins & Green, 1992; Santa Barbara Classroom Discourse Group, 1992; Putney & Floriani, 1999). From this perspective, classroom participants construct patterned ways of being as they construct knowledge together. From the beginning of their coursework together, the cohort participated in reflective activity as they interacted with each other and with various university faculty involved in teaching the courses. The cohort maintained a portfolio throughout their experience, and many of the activities and assignments resulted in reflection on assigned texts and their interactions with those texts. In addition, the cohort was asked to reflect on their lesson plans and their experiences in the PDS. At times the reflections were informal through small group and whole group discussions in seminar. At other times they participated in writing more formal reflection papers and in reflecting on their practice through their portfolios and curriculum notebook entries.

In particular, reflection was a component of the seminar in which they participated a semester prior to the online seminar. In the prior seminar the interns were asked to keep a daily log in which they recorded issues that arose from their reading assignments. They discussed their issues in class in small groups and selected one key point to share with the class as a whole. In addition, they wrote short reflection papers from these issue logs each week. The purpose of these assignments was to have the students reflecting on the major topics covered in the seminar such as classroom management, creating types of assessments, reporting student progress, and constructing a classroom environment conducive to learning. Therefore, self-reflection was a component of their educational process in terms of their work in the PDS. However, prior to the online seminar, the reflections were more related to the texts being used in the courses and their work with those texts and in the PDS setting.

The Context

Students in the PDS cohort began spending a greater amount of time at the school during their third semester in the program. Prior to this semester, they had observed teachers in the classroom, worked with individual students or with small groups of students at a time, and taught lessons that they constructed through their coursework. As their internship evolved, they began spending more time at the school as a field-based practicum in teacher education was supported by a weekly seminar in which topics germane to their experiences at the school were raised and discussed. The role of the seminar in the overall PDS program was to introduce and reinforce topics identified by COE faculty and PDS teachers as important to preservice teachers such as classroom management, coping with parental concerns, and authentic assessment. The seminar had been established as a forum for linking current research on teaching with the observations and experiences that access to the PDS classrooms afforded these interns. One of the important themes of this seminar in the third semester was the role of computer technology in elementary teaching and learning.

Cohort members had previously completed a required survey of technology in education as part of their undergraduate course work. In seminar they were introduced to two new ways in which technology could be used in education. The first activity introduced members of the seminar to a method of integrating mathematics, science, and computer technology into field-based learning. Mentor teachers at the PDS had previously been introduced to a similar methodology through a project sponsored by a Dwight D. Eisenhower grant (Heflich, Dixon, & Davis, 1999). The second way in which the cohort was introduced to technology in teaching and learning, the one presently under discussion, involved the use of online discussion as a venue for exploring students' experiences as they engaged in their practicum at the PDS.

The Assignment

Building upon the model first proposed by Harrington (1992), an effort was made to establish an online version of seminar in which the interns would discuss issues raised during their practicum. Each intern in the seminar was assigned a week in which to assume the role of discussion leader by posting a leading question on the listserv. Other interns could either respond to the leading question, or to one another's responses. The instructor corresponded with the discussion leaders each time, first discussing with them their ideas before they posted them to the listserv, and helping them develop the idea into a leading question. For the most part, the instructor remained invisible, monitoring the conversation, but not contributing to it. The online seminar began during the second week of the semester and continued for eleven weeks.

The Online Seminar as a Venue for Conversation

Student participation in the seminar was overwhelmingly successful, based upon the usage of the listserv. Each week two of the twenty-two interns would questions to the listserv, to which other cohort members responded. Twenty-one separate topics were raised during the online seminar. Those topics generated a significant amount of activity on the listserv. For example, collectively the questions generated 206 responses during the eleven weeks in which it was active, an average of 18.7 messages per week. The most active topic generated 17 responses while the least active, at the very end of the semester, generated but 3 responses. In terms of the individuals involved, the most active cohort members responded 19 times to various questions, while the least active participant responded only 2 times. On average, cohort members responded 12.7 times to questions posted online.

Topics Raised by the Cohort

Student discussion in the virtual seminar revolved around their experiences at the PDS, common classroom experiences, and the other technology-related experiences in which they were engaged in seminar. The topics discussed and the activity each topic generated is contained in Table 1. Far and away the most engaging topics involved behaviors they observed while serving in the PDS classrooms. Classroom-based topics involved managing student behaviors in the classroom, the use of computers in classroom learning, the celebration of religious holidays, the death of a student's family member, managing student's "tattling" on others, working with students who are labeled at-risk or for whom English is a second language, and how to cope with irate parents. Spending time in the school outside of the classroom was the source of other topics such as what constitutes a professional dress code for teachers, or the importance of reading at home with children, or maintaining positive relationships with administrators. Other topics emerged from their ongoing classroom experience as members of the cohort. These include a discussion that developed about a video documenting efforts to mainstream a student with special needs, comments about field-based learning, and reflections on their experience as members as members of the first cohort of students in an experimental preservice teacher education program.

Topical development

The ways in which topics developed during the conversation demonstrated the extent to which cohort members reflected on the issues and how their discussion led to growth as the discussion developed. An example of this is the discussion thread concerning teacher gossip about student behavior. The leading question was relatively innocuous:

> *We have been working very closely with the teachers at PPDS for several weeks now. We are with them during prep periods and lunchtime. In these last weeks I have learned a lot about what goes on outside of the classroom, between the teachers and the staff. During lunch I personally have noticed a tremendous amount of gossip between the teachers, about students and other staff members. Has anyone else noticed this? Is it like this in every school? What effects do you think it has on the children at PPDS?*

Some cohort members quickly responded to the question by characterizing this gossip as unprofessional behavior.

> *Thank you for bringing this up. I hear teachers' gossip about students all of the times in the faculty lounge. Sometimes this gossip is downright mean and very negative. If I were a parent of one of these students, I would have real issues with some of these teachers if this is how they talk about them to other teachers, how objective are they toward these students in the class? I just don't see these students being treated the same as the students that are spoken of highly in the lounge. Don't get me wrong, I think teachers need to vent and discuss things and get new ideas from each other. I don't think all of the nastiness is necessary.*

Others looked at lounge discussion as the one opportunity that teachers, otherwise stuck in classrooms with children, had to express their feelings about the experience to other adults.

> *This is a great question. There is what I notice clicks in the teachers lounge with the teachers. You see the same teachers sit together everyday and talk about what ever. By having lunch in the lounge you hear the teachers talking about the students in their classrooms. I think that because with the job we are doing there is no one in our classrooms that we can talk to; many teachers can't wait until lunch to explode and let everything out to others who will understand and relate to what they are going through. I also hear positive remarks in the lounge about how well teachers and students are doing. This must happen in all schools.*

Still other cohort members looked on such behaviors as ways that teachers could network with one another, sharing ideas about how to cope with problems in the classroom.

> *I agree that there is much gossip around the school. I also agree that many of the teachers are just venting their long hard days to people who can understand the* sort of day they are having. I think teachers should talk to one another about some students so that the next teacher can have a handle on students who have *behavior problems. On the first day of school, my mentor teacher filled me in on the students who were coming into her class. She knew the ones who hadprevious problems and already had some ideas on how she wanted to handle them. I always like to know what I'm walking into if I can.*

These messages demonstrate student growth in the midst of discussion in the virtual seminar. Beginning with the early characterization of teacher lunchroom conversations as gossipy and mean, cohort members began to posit reasons and rationales for this form of conversation. The realization that teachers working alone in classrooms and might need to discuss their day with colleagues in the lunchroom is an important one for preservice teachers. Understanding that they are likely to find themselves in a similar situation, they look to why it happens and speculate on how they will behave when they are professionals in a school. In addition, they offered coping strategies for each other to use in dealing with gossip so that they could use the information being offered in a positive way rather than just view it as negative and mean.

Discussion

The use of CMC as a venue for discussion among students involved in field placement is evident from the results of this study, particularly when considered along with the results reported by Harrington (1992). There are some key differences between the two studies that distinguish them from one another, but do little to invalidate either. Harrington (1992) reported on students in a traditional, albeit online, student teaching seminar. This study explores the use of an online seminar during a field practicum with a cohort of students who were well acquainted with one another. Although the groups themselves are very different, the methodology demonstrates the validity of using online seminars with students in field placements.

Certainly the knowledge that cohort members had of one another added to the depth of discussion that occurred in this seminar. The participants already knew about the background of their correspondent, the fact that they were a parent, or had children in school, or worked nights at a particular restaurant. This knowledge added a perspective to the conversation that would have been missing if it had occurred among those less well acquainted. Participants' knowledge of one another though had little impact on the ideas expressed or the thought that was apparent within their responses. It is difficult to say then that the participants' prior knowledge of one another invalidates the conclusion that the use of CMC in online seminars stimulates critical, reflective thought among participants that may heighten their moral development (Harrington, 1992).

Another area worthy of consideration is the participants' choice of content for discussion. All of the ideas introduced in the seminar arose out of students' experiences either in the PDS or in their class work. Prior to posting a question they discussed their ideas online with the Instructor. In these discussions the Instructor questioned the student about their idea, encouraging them to reflect on it before posting it to the group. This helped the student craft a question that generated a response among the group.

A key to the success of online seminars is the concept of a protected conversational space (Heflich, 1997). In depth conversation be it intellectual or intimate, occurs in a protected space limited to the individuals or group for which it is intended. One feels secure in what one has to say and assurance that what is said will be respected. The asynchronous nature of text-based CMC allows one the space to write a question, or respond to a question, without the pressure of real time. One can reflect on the response, perhaps edit it to better express a thought, before posting it to the listserv. Sproull & Keisler (1993) argue that asynchronous exchanges in CMC are empowering because personal elements of gender, ethnicity, and social status are invisible online. Such elements support the use of text-based CMC as a venue for critical, reflective conversation, appropriate for use in seminars of preservice teacher education students involved in field placements.

References

Anderson, R.E., & Ronnkvist, A. (1999). *Teaching, learning, and computing: 1998 national survey report #2.* http://www.crito.uci.edu/TLC/findings/Internet-Use/startpage.html.

Argyris, C. & Schon, D. A.(1974). *Theory in practice: Increasing professional effectiveness.* San Francisco: Jossey-Bass.

Bamberger, J. (1991). The laboratory for making things. In D. A. Schon (Ed.) *The reflective turn: Case studies in and on educational practice* (pp. 37-62). New York: Teachers College Press.

Becker, H.J. (1999). *Internet use by teachers: Conditions of professional use and teacher-directed student use.* http://www.crito.uci.edu/TLC/findings/Internet-Use/startpage.html.

Collins, E., & Green, J. (1992). Learning in classroom settings: Making or breaking a culture. In H. Marshall (Ed.), *Redefining student learning.* (pp. 59-85). Norwood: Ablex.

Feldman, A. (1995). *Conversation in teaching; Conversation as research: A self-study of the teaching of collaborative action research.* Paper presented at the annual meeting of the American Educational Research Association, San Francisco.

Harrington, H. (1992). Fostering critical reflection through technology: Preparing prospective teachers for a changing society. *Journal of Information Technology for Teacher Education, 1 (1). 67-82.*

Heflich, D. A. (1997). *Online interviews: Research as reflective dialogue.* Paper presented at the annual meeting of the American Educational Research Association. Chicago.

Heflich, D. A. (1998). *The symbiotic relationship between organizational culture and the constructive use of online technology in schools: thoughts of educators in the field.* Paper presented at the International Conference for Technology in Education. Santa Fe, NM.

Heflich, D.A., Dixon, J.K. & Davis, K.S.(1999). Taking it to the field: The authentic integration of mathematics, and technology in inquiry-based science instruction. Paper under review by the *Journal of Computers in Mathematics and Science Teaching.*

Iran-Nejad, A. (1994). The global coherence context in educational practice: A comparison of piecemeal and whole-theme approaches to learning and teaching. *Research in the Schools, 1 (1),* 63-76.

Lortie, D.C. (1975). *Schoolteacher.* Chicago: University of Chicago Press.

McIntyre, S. R. & Tlusty, R. H. (1995). *Computer-mediated discourse: Electronic dialogue, journaling, and reflective practice.* Paper presented at the annual meeting of the American Educational Research Association. San Francisco.

Mezirow, J. (1990) How critical reflection triggers transformative learning. In J. Mezirow (Ed.) *Fostering critical reflection in adulthood* (pp 1-19). San-Francisco: Jossey-Bass.

Putney, L. G., & Floriani, A. (1999). Examining transformative processes and practices: A cross-case analysis of life in two bilingual classrooms. *Journal of Classroom Interaction*, 34(2), 17-29.

Santa Barbara Classroom Discourse Group. (1992). Constructing literacy in classrooms: Literate actions as social accomplishments. In H. Marshall (Ed.), *Redefining student learning: Roots of educational change* (pp. 119-150). Norwood, NJ: Ablex.

Scardamalia, M., & Bereiter, C. (1996). Computer support for knowledg-building communities. In T.Koschmann (Ed.) *CSCL: Theory and practice of an emerging paradigm.* Mahwah, NJ: Lawrence Erlbaum Associates

Schon, D. A. (1987) *Educating the reflective practitioner.* San Francisco: Jossey-Bass.

Sproull, L., & Kiesler, S. (1993). Computers, networks and work. In L. M. Harasim, ed. (1993). *Global networks: Computers and international Communication* (pp. 105-120). Cambridge, MA: MIT Press.

U.S.Government. Department of Education (1999). Preparing tomorrow's teachers to use technology.

HOW INFORMATION TECHNOLOGY CAN HELP EDUCATION DISTANCE LEARNING

HOSSEIN JAHANKHANI, PhD, CPhys, MinstP
UNIVERSITY OF EAST LONDON

Abstract: The aim of this paper is to review how information technology i.e. computer based studies can help education particularly in distance learning. Although this review will concentrate on distance learning it will also discuss and compare ideas such as open learning and flexible learning. The economy behind, and advantage, disadvantage of the distance learning will be analysed and compared between conventional, distance, open and flexible learning.

INTRODUCTION

This paper reviews the impact of information technology i.e. how computer based studies can help education particularly in distance learning. Although this evaluation will concentrate on distance learning it will also discuss and compare ideas such as open learning and flexible learning.

At this stage it is difficult to judge the impact of information technology and networking (internet, web sites) revolution. This remains unknown however, experiences offered by the information technology suggest that it may change our life style.

How can we define distance learning, very confusing according to various definitions. Distance learning is a generic term that means education where you are physically separated from the institution conducting the course. Open Learning, is an extension of distance learning and a buzzword for offering courses in a non-traditional way by opening up the course to those who wouldn't normally be able to use it. Open learning, flexible learning, online learning, distance learning, are very vague terms and may not mean anything in particular (Greville Rumble,1990) calls for a need for greater clarity in the use of these concepts if we are to avoid misleading others and ourselves.

Basically, all the terms mentioned refer to distance learning. Distance learning is any learning that takes place with the instructor and student geographically remote from each other. Distance learning may occur by surface mail, video, interactive or cable TV, Internet, video-conferencing, etc. Therefore in distance learning, there is a gap between the provider and the learner for some, most, or even all of the time. For example, various correspondence learning agencies, and some in-company training Foremost the Learner, Tutor (institution), learning centres for support, the media - technology for interaction and support, various forms of technology for interaction. By using a computer based training system in a distance learning environment, students not only acquire the competence needed to meet the requirements of the syllabus in question, they also enhanced their general technical and learning skills. Therefore, by employing existing staff and environmental resources, training can be delivered to student across wide geographical area who would otherwise be unable to access training resources. Of course, there are drawbacks in this process. Some courses just do not fit very well at a distance. These types of courses need a hands on and gain experience practice. For example we don't want our GP (General Practitioner to learn his or her practice through distance learning, but rather via conventional learning, but we have learned that the fact computer changes the dynamics of communication. In return it is not suggested that distance learning should replace all traditional teaching. For many purposes face-to-face learning situations have advantages over learning alone, and peer group interaction is a vital part of many kinds of learning.Also in distance learning the economical advantages are achieved, both for students and trainees, and for the institution which takes care of the learning process. Since there is no need for travelling, trainees and tutors have not to waste their time and money. On the other hand, from the point of view of these institutions, neither equipment nor lecture rooms have to be prepared.

By far the best situation in which to develop flexible learning resource materials is by being involved face-to-face with 'traditional students'. The ultimate aim may be to produce resources which can promote learning without the presence of a tutor, but the hand-over of control is best done one step at a time, with thorough monitoring of each move towards learner autonomy. A longer term aim should be to establish distance-learning pathways, built initially from those flexible learning resources that prove their worth with conventional students.

At this age of technology, the technologies can support almost all of the components of distance education. Information and communication technologies that must help in implementing such systems are already in place. We now have different types of networks system that can use applications to communicate across the whole world. From the technical point of view the major changes and development can be traced out in concepts of WAP (Wireless Application Protocol) and B - ISDN (Broadband Integrated Service).

To implement distance learning programs through development of the three elements crucial to a successful distance education program: (1) Sound instructional design; (2) Appropriate technology applications; and (3) Support for teachers, students, and collaborative partners.

A distance learning program must meet the educational goals of the institution. Therefore, implementing such a program requires time, people, funding, and careful planning.

The progress of time is inevitable and we can only hope to shape its direction, distance education is definitely the wave of the future.

As (Bates, 1996) pointed out quite categorically "the value of technology is its ability to reach learners not only well served by conventional educational institutions, but also to meet better the newly emerging educational needs of an information society, and to improve the quality of learning".

Within last decade it has become possible to work in a rich variety of ways with others at a significant distance through the use of a personal computer with an internal connection. For many people, their Web browser has already become most important program running on their machines.

Distance learning offers an opportunity to outsource teaching to specialised companies without taking employees away from their work. To gain faster acceptability and recognition, some of their companies have entered into co-operative arrangements with accredited colleges and universities.

Patterson in his paper emphasised the importance of a progression from high teachers' support levels to increased student empowerment. Where technology is concerned, a Bermuda triangle i.e., Teaching - Learning - Computers, may develop with money being poured in to little effect. The World Wide Web offers advantages in several directions. Hypertext linkages in the material mean that a student can work at a suitable pace and can revise and review on demand. The great advantage of the Web is that distance learning is no longer platform dependent it does not matter the sources. It is thus possible to provide a very rich learning environment using the Web. Hypertext links provide an advantage that a conventional course, or course notes can not provide. Although, Web based teachers and their students may be scattered all over the world, the computer can help to over come the disadvantages of physical separation.

The key economic advantage of distance learning over traditional on-site schooling is that it saves students time. The value of the time-spent learning is the principal cost of investment in human capital among adults with even moderate earnings (Duhaney, 2000, Mitchell, 2000, Ohler, 1999)

COMPUTER BASED STUDIES/TRAINING

Higher education has offered distance learning courses for several years , their numbers until recently have been relatively small. The grows use of internet are greatly changing the face of distance education. Computers have been used in many ways in education since 1960/1970's, however the types of use have expanded and the number of students using them has grown. The computer based learning allows the learner to work through pre-designed materials. The most significant feature of *'CBL'* is that the learner interacts solely with the computer.

In computer mediated communication method of distance learning the learner has opportunity to be contact with teachers and other students, through his/her computer. Through online facilities such as e-mail, video conferencing, people can easily contact each other and transfer data files, text and obtain information from computer databases.

Extensive research comparing grades, test scores, and other measures of student achievement has been compiled, and analysed. Generally seems that there is no significant difference between students in virtual classrooms and students in traditional ones.

A similar study in the Journal of Computing in Higher Education shows that, cyber learning can be as effective as traditional classroom learning, (RUSSEL, 2000), and that there was no significant difference in academic outcomes between the two groups of students tested. Indeed, so far almost

3 million students in America and Canada and Europe already enrolled in distance learning. It is expected that in near future about 80% of U.S. universities and colleges will be offering online classes (EBSCO ONLINE, 2000). Computer based training or Web based training (WBT) is used extensively in industry to train learners and accessible using a computer. The courses are designed to simulate the software being learnt and are pre-programmed and stored digitally on a compact disk (CD-ROM). Courses usually include compressed videos, audio graphics, animations and sound. On the other hand the term WBT means that the training is delivered via internets. It is not, need to be just in the Open University that computer conferencing is used for education. However, the medium is most easily justified when students are distributed widely, and at present the Open University in the United Kingdom plays the major role in this area. Things will undoubtedly change as the

various scheme which support open learning are beginning to start up; indeed, any polytechnic or college with access to a sizeable time-sharing system could start a computer conferencing system. An interesting development in this area is the proposal to use national electronic mail facilities to support programming courses for micro users, in partnership with an educational body.

The advantages and disadvantages of distance education

Advantages:

Undoubtedly the main advantage over traditional on site learning is the amount of time it saves. Students don't have to get up, take an hour getting ready and then an hour getting to school or college and another hour travelling home - essentially three hours a day of "wasted time". They can just stay at home and spend the time learning. This is especially important for people with full time jobs or children who can choose the most convenient time for them to study (DL rarely follows a strict timetable like colleges) without affecting their work or leaving their children.

Distance Learning is also especially useful for adults who want to do a degree or executives and highly skilled workers who need to update their knowledge and skills but don't have the time to go to college.

Distance education is more flexible, accessible and rewarding than the physical classroom environment. It gives the adult learner the opportunity to choose the time, place and pace for his study without being trapped in fixed time slots at the college or time-consuming and uncomfortable travelling from his home to the campus.

Distance Learning gives more students the opportunity to take courses from top universities where physically, places are limited e.g. for every ten students who get a place at Oxford, Cambridge or Harvard, there are probably another hundred who deserve a place.

It gives the learner the opportunity to reflect creatively on his own writing. A student learns the ability to formulate the ideas and opinions in writing in such a way that their meaning is clear to other people who are not physically present essay (Bates, 1995).

In addition to that distance teaching universities such as the 'British Open University' are demonstrating significant cost advantages compared to the traditional universities because of the reduction in the need of campus based student facilities such as buildings or administrative and academic staff and because of the economies of scale. Distance Learning via the Web is much cheaper, around 50% to 90%, than traditional courses as there are less teachers, buildings, materials and so on to be paid for. This can also save the Government money along with the economies of scale achieved by many individual institutions sharing their resources and knowledge to provide courses e.g. The UK government is currently seeking to establish an "e - university" whereby they will organise a collaboration of UK universities to provide their expertise for online courses.

It offers the companies a very interesting possibility to educate their employees. Online-based distance education offers significant cost advantages. It eliminates travel to and from a specific location. With this option, employees simply log on to any Internet connected computer and begin the training session. Schlumberger PLC, a $9-billion international technical service company, began implementing "just in time" distance teaching in spring 2000 to offer his employees training when it will be most useful and when it will stick best (Ebsco Online, 2000).

Most importantly perhaps is that DL could have a great impact globally by allowing people in the "Third World" the opportunity to learn without its nations needing to find the money to build schools, buy books, pay teachers and so on. This could aid their development.

Disadvantages:

- A problem of distance teaching is that the learner doesn't get in touch with other students and lecturers compared to the traditional education with seminars and workshops on the campus. There is a lack of in developing his social skills such as working in a group and to interact with each other order to find a solution for a task, which is based on the consensus of the group.
- Though it works well with things like business studies, history etc DL can't be used to take certain courses where hands on experience is needed such medicine, dentistry, some engineering courses.
- There are individual preferences and differences particularly among adult learners. Online teaching can't suit all students. The developers and planners often seem to forget the fact that people are different and that they differ just as much in their preferences for learning modes as they do in other areas in their life. Some of the learners will benefit greatly from this medium other will rather prefer traditional teaching methods (Mason and Kaye, 1989).

- Converting courses from a classroom to the Internet is hard work for lecturers & Professionals this needs a lot more commitment of time from them e.g. A barrage of e - mails back and forth between students around the clock and more time writing up lecture notes.
- There is no physical peer contact/social interaction between students which may take some of the fun out of learning. The impersonal nature of online learning also removes the enthusiasm, skill and wit of lecturers.
- The commentator, also fears of the dangers of profit making companies entering the DL market that it is "commodifying" education and making courses competitive. This could lead to an emphasis on quantity rather than quality and individual attention. If the academic is replaced by the businessman it could spell danger for the student.

DISTANCE LEARNING (FLEXIABLE LEARNING) IN THE UNIVERSITY OF EAST LONDON

UEL has a strong national reputation for teaching students of all ages for over 30 years. One of the courses running under Flexible Learning program is BA (HONOURS) IN Business studies. The course is part of the portfolio of courses offered by East London Business School in undergraduate, Postgraduate, MBA and Doctorate levels. About 100 students registered under Business studies scheme. A primary vehicle for achieving this level of co-operation will be the electronic communications network. You will be able to "talk" to others in a group by using the electronic conferences and you can exchange information with individuals by using e-mail. Every student has personal tutor. By visiting the courses World Wide Web site they should able to collect assignment or any other information which they require.

CONCLUSION

Distance learning have played a tremendous part in education over the years, previously known as correspondence courses. Distance learning is a product of the removal of the educational barriers. It is the delivery mechanism that allow anyone access to educational institutions irrespective of where they are, time and space via the media of technology. The teaching and learning paradigm is reversed, whereby the tutor is now a facilitator and the learner has the responsibility of learning in their own time, space and place. As well as making their own decision on how to structure their course. Communication is by means of technology, such as, printed text, videotapes, electronic mail, fax, telephone, video-conferencing, audio-tapes, internet and so forth.

Like all things we have advantages and disadvantages with DL but despite the disadvantages, we must surely conclude that CIT (Communication and Information Technology) in its various forms has had a great impact on education and vastly aids the student to produce well presented and well informed coursework.

Its unlikely that DL will totally replace face to face teaching but it will definitely supplement it. At the end of the day, CIT and DL doesn't make a bad student a good student - they still have to do the work, learn the subject, pass the exam. It appears then that CIT is having a positive impact on education and hopefully, as access to the Web continues to grow rapidly, this will become a global movement whereby education can enrich the lives of people across the world.

REFERENCES

1) Russell, T (2000), No significant difference (on line), Available : http://cuda.teleeducation.nb.ca/nosignificantdifference/.

2) Duhaney, D. (2000) 'Technology and the educational process: Transforming classroom activities', *International Journal of Instructional Media*, 27(1), 67-71.

3) Mitchell, L. (2000), E-learning makes the grade, *Infoworld*, 22(30), 53-54.

4) Ohler, J. (1999), 'Why distance education?', *Annals of the American Academy of Political & Social Science*, 514, 22-35.

5) Rumble, G. (1990) 'On-line costs: interactivity at a price' in
Mason, R. And Kaye, A. Mindweave: Communication, Computers and Distance Education, Oxford: Pergamon.

6) Bates, A.W. (1996) Technology, Open Learning and distance education. Rouledge, London

7) Bates, A.W. (1995) Research and development in distance education in Lockwood, F. (ed.) Open & distance Learning Today, London : Rouledge

8) Ebsco Online, 2000

9) Mason, R. and Kaye, (1989) A. Mindweave : Communication, Computers and distance education, Oxford : Pergamon.

Matching Distance Education With Cognitive Styles in Various Levels of Higher Education

Steve M. Jenkins
Department of Psychology and Behavioral Sciences
Louisiana Tech University
United States
Stevenmjenkins@yahoo.com

Walter C. Buboltz, Jr.
Department of Psychology and Behavioral Sciences
Louisiana Tech University
United States
Buboltz@woodard.latech.edu

Lamar Wilkinson
Department of Psychology and Behavioral Sciences
Louisiana Tech University
United States
Lamar@woodard.latech.edu

Sonia Beatty
Department of Psychology and Behavioral Sciences
Louisiana Tech University
United States
Soniabeatty@hotmail.com

Abstract: Technological advances in distance education have resulted in a myriad mediums available for educators to deliver course materials. As technology pervades higher education, educators should be mindful of what mediums and materials can lead to successful learning for the various individuals the course will be reaching. In order to maximize learning potential, courses need to be tailored to the learning styles or "cognitive styles" of the students in each course. The greatest diversity of cognitive styles will undoubtedly be seen in general introductory courses that are required of all university students. However, this diversity will generally narrow as students gravitate toward their field of specialization. With the increasing number of non-traditional students (over age 22), educators must also meet the challenge of designing courses that are directed toward the cognitive styles of a population that may not be as technologically savvy as their younger counterparts. Equally important is the question of, "Is distance education appropriate for all students?" During the first years of college, students are learning valuable social and relationship skills. For this population, the convenience and cost efficiency of distance education may come at the expense of interpersonal development.

Introduction

With the rapid infusion of technology into education, there has been a proliferation in the instructional mediums that are employed. Due to the fast pace of technological advances in today's society, researchers and educators alike have not had the opportunity to fully explore the characteristics and effectiveness of these new educational mediums. Research is beginning to emerge that is examining the effectiveness of various mediums, and the characteristics of these mediums that lead to successful learning in distance education environments (Molebash, 2000; Offir & Lev, 2000). In reviewing the literature, one aspect of these new educational mediums which is not receiving a great deal of attention, is the characteristics of the learner. The main question addressed in this article is, "Is distance education appropriate for all students, or do we need to design distance education to meet the needs of individual students?" It is our belief that by taking into account characteristics of students, distance education can be designed to better meet the needs of students.

In the past, where distance education was limited to such technologies as television courses (McCleary & Eagan, 1989) and telephone instruction (Burge & Howard, 1996), obtaining educational results similar to traditional classroom instruction was quite an accomplishment, considering obstacles such as lack of visual aides, or the impossibility of student interaction. With advances in computer technology, a seemingly endless list of medias are now available to deliver instruction to students (Marsh, Price & McFadden, 2000). Considering theses advances, a goal of developing distance education courses that are roughly equivalent to classroom instruction, appears to be nothing more than striving for mediocrity. We now have the potential for designing distance education courses that will allow students to maximize their potential and learning. This is not meant to imply that the classroom teacher will one day be obsolete. In fact, it is arguable that distance education courses are not suitable for certain types of classes and students.

Not all individuals process information in the same manner. The way that an individual usually processes information is commonly referred to as "cognitive style" or "learning style" (Witkin & Goodenough, 1981). Different cognitive styles require different presentation types, as well as materials, to enhance learning. Classroom teachers face the difficulty of trying to meet the individual needs and learning styles of a diverse population. In instances where the teacher must attend to the needs of an individual student, learning can slow or, at times, completely stop for the rest of the students in the classroom (Moore, 2000). With distance education courses, classes could be designed to match individual learning styles, without slowing instruction for students that do not require individual attention. Furthermore, college students are no longer solely between the ages of 18-22. Columbus State University in Georgia report an estimated 45 percent of their enrollment consists of "non-traditional" (over the age of 22) students (Langford, 2000). Students in different age groups are likely to have differences in maturity level, preferred learning style, and experience. This diversity in students makes the cognitive styles in higher education even more varied than before web-based courses were possible. In order to maximize learning potential, distance education courses must meet this diversity by tailoring distance courses to individual cognitive styles.

Cognitive Styles

Alport (1937) defined cognitive style as, "an individual's habitual or typical way of perceiving, remembering, thinking and problem solving." Over the years, several theories and constructs have emerged in the area of cognitive styles and how they relate to learning theories. Witkin's (1954) field dependence-independence theory has served as somewhat of a foundation for research in this area. He observed that people have individual differences in their ability to distinguish objects from a confusing or distracting background. This concept was expanded upon, and proved to have practical applications in the way individuals learn.

Field dependence-independence theory, as related to cognitive style, evolved out of Witkin's observation that individuals differ in their ability to separate an item from an organized field or overcoming an embedding context. He found that this concept is actually a universal dimension of individual functioning, in that it shows itself in not only perceptual contexts, but also in intellectual, personality, and social aspects of how individuals process information. (Witkin & Goodenough, 1981). Field dependent people show more interpersonal competencies, function at a more autonomous level, and enjoy cooperative learning more than field dependent individuals. Conversely, field independent individuals are superior at cognitive restructuring and independent learning, yet lack the interpersonal competencies of field dependent individuals. Although some subjects did show extreme dominance, most showed a general tendency toward either field dependence or independence with some ability in both areas. Dimensions of field dependence-independence were also found to be stable over time, and that people are likely to favor and show superior performance in educational/vocational settings that match their cognitive style (Witkin & Goodenough, 1981).

The importance of matching cognitive style with distance education is not a new concept. Dunn (1989) found that students learn, remember, and even enjoy learning more, when instruction is matched with learning style preferences. However, what is commonly overlooked (or under focused), are the vast differences within the higher education population, even at a single university. It seems highly unlikely that a universal format for distance course construction would be suitable for both an 18-year-old freshman and a returning adult graduate student. As alluded to earlier in this article, in order to maximize the potential of creating distance education courses that are superior to traditional classroom instruction, distance education courses should be constructed with an effort to match the cognitive styles of the population within each class whenever possible.

In order to insure that the cognitive styles of students are appropriately matched with the materials and mode of delivery of a course, the cognitive styles of the students should be assessed prior to formal instruction. As students progress through the various levels of higher education, the population of each course they take part in will undoubtedly vary. The design of the course must therefore evolve to meet the changing needs of students. When assessing the cognitive styles for a particular course, the level of education, technological competence, and life experiences of the students in that course should all be taken into account to design courses that will maximize the learning of those students.

Undergraduate Freshmen

The transition from high school to college is generally a period of educational and social adjustment for most students. New levels of social relationships are being developed that are important to the development of the student. This is also often a first experience of living away from ones family and friends and, according to Horn (1997), "...those who extend their associations beyond the classroom may well find their transformation into *college students* to be easier and more complete." Social interaction is, of course, limited for students taking web-based courses. Students may engage in social activities with other students and teachers via the internet. However, the levels of social interaction and intimacy of these activities are inhibited by distance. Not only are students unable to participate in social outings, they will not be able form face-to-face working relationships when collaborating on team projects or delegating project responsibilities. Hence, students are not developing the skills for face-to-face social and professional relationships that are necessary in almost any career. Likewise, distance education does not provide the development of true public speaking skills. When students deliver speeches or give presentations through distance education courses, the speeches are performed in front of a computer camera, rather than an actual audience that the student will undoubtedly have to face at some point in his or her future career. The development of social skills is often vital to the future career of the student. Work by Mintzberg (1997) showed that managers spend between 63-69% of their work time engaged in conversation. For all of these reasons, it is questionable if distance education courses are appropriate for traditional college freshmen in the first place. However, in certain circumstances (i.e., those living in remote areas) students may be left with little other choice.

In any case, lower-division classes such as; Introduction to Biology, or World History, will undoubtedly contain students with a wide range of cognitive styles. Most American universities require students to complete a number of general education courses before they can specialize in a field of preference. Distance education courses at this level should be designed with this in mind. Professors in fields such as physical science, which traditionally attract individuals who are adept at individualized learning (field independent) (Witkin, 1962), may be inclined to produce a distance education course from this perspective without regard for learners who require a more interactive approach (field dependent). Conversely, humanities professors, that are traditionally more social in nature, will need to incorporate technical concepts into the class design to facilitate students who are more cognitively field-independent.

Ultimately, professors must look outside of their cognitive style paradigms to accommodate the myriad cognitive styles students possess in their courses. While the extreme field independent learners could be accommodated with what Bates (1986) refers to as the black box approach which simply lets the computer replace the teacher, the extreme field dependent learner may be best suited with options such as interactive study guides and student video chat rooms. Preparing a lower division course in this fashion has the potential to be quite labor-intensive and costly. To accommodate a variety of learning styles, educators may have to utilize the expertise of several educational consultants, as well as incur additional expenses from computer programmers for the hours needed to implement the extensive design of the course. However, even with extensive design expenses, these courses can still be cost effective considering the large numbers of students that will utilize them. Introductory courses generally have the largest class sizes because they are pre-requisites for advanced courses in various majors. Likewise, if these courses are not constructed to match individual learning styles, a greater number of students stand to be adversely effected.

Advanced Students

As students move into their chosen field of study, media type and instruction could be tailored more closely to the learning styles of students that are attracted to that particular field of study. For students enrolled in upper division sales and marketing classes (which are people oriented by definition), a team oriented and interactive course format may be most conducive to learning. For such a course, student teleconferencing sessions could be held to brainstorm marketing strategies for a new product. Conversely, this format could be counterproductive and even aversive to those who tend to gravitate toward the physical sciences. As Kolb (1984) suggests, these students are often quite adept at technical tasks and less so at social and interpersonal skills. As the student moves further along in his or her chosen field of study and into graduate school, it may be advantageous for both student and teacher to adjust course structure, focusing more stringently on the learning style associated with that particular field. For doctoral research courses in environmental biology, the needs of the student may be best met if the instructor simply issues a course syllabus that outlines research duties and expectations, and offers periodic feedback via e-mail.

So far we have focused on academic areas that are at opposite ends of the spectrum (extreme field independence vs. extreme field dependence). As noted earlier, learning styles are not necessarily mutually exclusive. Most individuals show a dominance in either field dependence or field independence, however, most students also possess some level of competency in both fields. Therefore, educators must use caution when deciding to adapt a distance education course to strictly emphasize a specific cognitive style. Students specializing in an area such as counseling psychology, which emphasizes the "scientist-practitioner" model of training, may have characteristics of both field dependence and field independence. While scientists often prefer individualized learning, training to be a practitioner involves constant interaction with others. In such cases where the field of study emphasizes contradicting learning modalities, an optimum learning environment through distance education would include a variety of medias and instructional materials. Students would be able to utilize aspects of both field dependent and field independent stimuli for an integrated learning experience.

Non-traditional Students

Non-traditional students represent another unique population. According to Watkins (1983), non-traditional students tend to be more intrinsically motivated, and rely more heavily on an approach that is deeper than rote learning, when compared to younger students. In some universities, a substantial portion of the student body consists of individuals that are well outside of the traditional 18-22 year old range. According to the 1999-2000 San Diego State undergraduate catalogue, more than 10% of the student population was over the age of 30 in 1999. Even though learning styles are stable over time, the returning student that has been away from the academic world for quite some time will most likely have not exercised university-type study skills in many years. Most of today's "traditional" college students have had exposure from an early age to computer technology both inside and outside of the classroom. Some of the mature students, who have not had the advantage of being brought up in the technological era, may have little or no computer experience. Therefore, the technological competence of the student needs to be assessed before instruction begins to insure that each student has the ability to access and utilize all of the course materials. Aside from the obvious needs of the non-traditional student often mentioned in most literature (i.e., flexible scheduling for the employed student), tutorials and "user friendly" study guides geared toward the learning style of the individual non-traditional student, could be greatly beneficial, or perhaps necessary, for readjustment into academia.

Conclusion

As distance education becomes more pervasive throughout the higher education system, and as new technologies develop, course development that is continually conscientious of the learning style of the individual is necessary to maximize learning efficacy. An exigency to encourage all students to take part in distance education courses may be very attractive and practical for both student and professor in the interest of convenience and financial considerations. However, for students attending college directly from high school, distance education courses may not be in the best interest of the student's interpersonal development. Considerations must also be made for the non-traditional student's readjustment to academia. It seems apparent, that in order to facilitate student learning, distance education courses should be tailored to match material, presentation, format, and interactional patterns with the learning styles of students.

References

Alport, G. W. (1937). *Personality: A psychological interpretation.* New York: Holt & Co.

Bates, T. (1986). Computer assisted learning or communications: Which way for information technology in distance education? *Journal of Distance Education, 1*, 41-57.

Burge, E. J., & Howard, D. (1990). Audio conferencing in graduate education: A case study. *American Journal of Distance Education, 4*, 3-13.

Dunn, R. (1990). Understanding the Dunn and Dunn learning styles model and the need for individual diagnosis and prescription. *Reading ,Writing, and Learning Dissabilities, 6*, 223-247.

Horn, S. K. (1997). Ideas in practice: Extending collaboration beyond the developmental classroom. *Journal of Developmental Education, 21*, 26-32.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development.* Englewood Cliffs, NJ: Prentice Hall.

Langford, S. (2000). *Daycare question continues* [On Line]. Available: *http://saber.colstate.edu/issues98/030298/030298daycare.htm*

Marsh, G. E., Price, B. J., & McFadden, A. C. (2000). An overview of online educational delivery applications. *Information Technology and Teacher Education Annual, 1*, 165-170.

McCleary, I. D., & Egan, M. W. (1989). Program design and evaluation: Two-way interactive television. *American Journal of Distance Education, 3*, 50-60.

Mintzberg, H. (1997), Leadership: The managers job: Folklore and fact. In R. P. Vecchio (Ed.), Understanding the dynamics of power and influence in organizations. (pp. 35-53). Notre Dame, IN, USA: University of Notre Dame Press.

Molebash, P. E. (2000). What tomorrow may bring: Trends in technology and Matching Distance Education. *Information Technology and Teacher Education Annual, 3*, 2438-2444.

Moore, B. (2000). Higher level thinking skills and individual differences: Bridging gaps with technology. *Information Technology and Teacher Education Annual, 1*, 74-79.

Offir, B. & Lev, Y. (2000). Content analysis as a tool for evaluating the effectiveness of distance learning systems. *Information Technology and Teacher Education Annual, 1*, 183-188.

Watkins, D. (1983). Only rote learning needed at ANU. *ANU Reporter, 14*, 3.

Witkin, H. A., (1962). *Psychological differentiation: Studies of development.* New York: Wiley.

Witkin, H. A., & Goodenough, D. R., (1981). *Cognitive Styles.* New York: International Universities Press.

Is A Paradigm Shift Required To Effectively Teach Web Based Instruction?

Michael G. Kadlubowski
(Ed.D. Candidate – Educational Technology, Research, & Assessment)
Northern Illinois University

Thesis Objective

The hypothesis of this thesis is to present to the reader an argument as to whether existing educational paradigm's, philosophies, pedagogy, and practices require revision to effectively teach web based instruction. Due to the length restrictions of this paper the reader is advised that not all paradigm's, philosophies, and practices are included, and those that are evaluated as to their usefulness in web based instruction are very limited in scope, definition, and explanation. In all probability you will find that this paper will ask more questions than it answers, but in doing so will hopefully stimulate each of us to view and analyze the effectiveness of the current practices employed in web-based instruction.

Background

As early as 1973 Daniel Bell, and later in 1980, the futurist Alvin Toffler identified several massive changes that our society has undergone: from the agrarian age to the industrial age, and now entering into what some call the information age. These futurists, among others predicted a complete change in our societal values, and the reforms that would be necessary to accommodate the change from an industrialized to an information based society. In many cases, these futurists were correct in their predictions, and our society today is indeed mired in the process of adjusting itself to accommodate this new age of information and technology.

In looking at our educational systems and the population of students that these systems serve we find quite a vast array of scope and difference among students. Demands upon and within the educational sectors are changing. For higher education, demographics and workforce changes are fundamentally altering the student population. In 1995, 44 percent of all college students were over 25 years old, 54 percent were working, 56 percent were female, and 43 percent were attending college part time. In 1997, more than 76 million American adults – 40 percent of the adult population – participated in one or more adult education activities, up from 32 percent in 1991 (*National Center for Education Statistics*).

Today a students' lifestyle and objectives are also very different than those students of yesteryear. It is not at all uncommon to find that today a typical student may be a single parent, who may be working two or more jobs to make ends meet in order to provide for their family. This same person may want to pursue a higher education, but may be unable to do so as a result of time commitments and constraints that are usually and traditionally required in institutions of higher learning. Additionally we find that many students do not have specific available time blocks, which they can reserve or allocate to a particular course or educational unit of instruction on a regular basis.

More students than ever before engage in learning programs that offers courses at nights or weekends. Some educational institutions even offer courses on Sundays – which in some religions could be considered a sacrilege! Additionally schools have realized that in order to sustain themselves and to remain competitive they must adjust their offerings to accommodate this diverse and ever growing population of students.

As a result of newfound technological advancements in the fields of computer technology, education, and instructional technology, we find that web based instruction is becoming somewhat commonplace in what would be considered traditional higher educational settings. Many schools including Northern Illinois University now conduct a minimum of some type of web-based instruction. Additionally an entire new industry of web-based instruction has risen to compete with the universities in this endeavor.

In those otherwise traditional institutions where the implementation of web-based instruction has been accomplished, the school is assisting the non-traditional student in the meeting of their educational goals and objectives. The school is also meeting its' social obligation to educate even the most non-traditional of students. Now that the movement toward web-based instruction is underway, the question and thesis of this paper, is whether a paradigm shift is necessary or required to effectively support the non-traditional student in their use of web-based instruction.

Instructional Paradigms & Theory

A paradigm as defined in Webster's Encyclopedic Unabridged Dictionary of the English Language is an example serving as a model and/or a set of forms all of which contain a particular element... based on a single stem or theme. Therefore in extrapolating and interpolating the term instructional paradigm we could state that the definition would be a set of forms or examples of educational theory and practice based upon particular elements. You could in a broader sense regard this as the practice or pedagogy of instruction.

Probably the most noteworthy expert on instructional design paradigms is Robert M. Gagne, who authored the *Principles of Instructional Design*. Gagne bases his paradigms on the belief that instructional design efforts must meet intellectually convincing standards of quality and that such standards need to be based on scientific research and theory in the field of human learning. Gagne takes into consideration learning outcomes, including intellectual skills, cognitive strategies, verbal information, attitudes, and motor skills. He also considers the knowledge, skills, and abilities of learners and how the differences among learners affect instructional planning and design.

Additional instructional paradigms and principles include the behaviorist also known as the cognitive method and the constructivist orientation or theory of instruction.

Behaviorism was a term coined by the American psychologies John Broadus Watson (1878-1958) in his paper, *"Psychology as the Behaviorist Sees It."* It is a theory of animal and human behavior holding that actions can be explained entirely as responses to stimuli, without accounting for the profound influences of interpretation on introspection. Thus an educator who believed in behaviorism would tend to attribute learning as a reaction to an event or action that would stimulate the student, but would be provided by the educator. To the behaviorist teaching is essentially a matter of arranging contingencies of reinforcement so as to produce and maintain prescribed behaviors.

Constructivism is quite an opposite paradigm of behaviorism as described and defined above. Brunner first proposed the concept of constructivism in the mid-1960's and builds on earlier ideas of Piaget. Basically, the theory of constructivism holds that the learner rather than the educator develops or constructs knowledge and that opportunities created for such construction are more important than instruction than that which originates from the educator. This is certainly not to state that there is not educator guidance or involvement, but that the student essentially will have a very strong voice in the selection and completion of tasks that will aid her in their learning approach to the given subject matter.

Now that we are acutely mindful of three major paradigms, philosophies and/or theories of instruction lets determine whether a change or shift in these philosophies is required in instruction that is provided to students via the world wide web.

Web Based Instruction

If we look at the delivery of information and learning via web based instructional systems we find some similarities to traditional learning, however we find more differences than similarities. We find that many web based instructional systems do indeed make use of stimulants such as movies, sounds, and graphics. We also find that the best web based instructional sites provide a reference library of sorts, to assist the student in their understanding of the material elements of the particular course. These reference libraries are usually hyper links to other educational or related web sites, which the student can use as a resource to further their understanding of the materials. Some hyperlinks use video and animation to gain and hold the attention of the student, while others are merely "page turner" type of information sites.

But what of the interaction that takes place in the traditional classroom? What becomes of the theoretical arguments that an experienced educator would foster, stimulate and encourage among the students and/or the educator? What becomes of the personality and strength of conviction that normally results as a benefit of these stimuli? Are they lost in web-based instruction? Can a chat session accomplish and achieve the finer points of theoretical argument without having the face-to-face stimulants and reactions that are readily apparent in a traditional classroom?

I believe that the response to these questions is that it depends upon the design of the course and the process of delivery that is used. If a web site course is designed along the lines of the Gagne theory of instructional design, it could certainly achieve and accomplish its' objective. However while the elements of design are crucial, so is the interaction of the students with both each other, as well as the educator. I believe that regardless of how well web-based instruction is designed, if it is designed solely as a stand-alone product without any human interface or interaction it will not meet its ultimate goal to educate. Most students need interaction and human intervention so as to gain the sociological elements of instruction.

I have had the personal opportunity to teach web-based instruction. I have found that even on the best graphically designed web site, the student needs and actually will seek out interaction with another student or the educator. This human intervention and interaction is crucially required of most students, but not all. Some students are perfectly content viewing and reading information from a computer monitor and learning in this way. But the fundamental question remains: what is the objective of the particular course, and what is the desired instructional outcome? If these two questions do not include the learning of interaction among culturally diverse students, have we not failed to meet our social obligation to educate?

To illustrate further I have discussed web-based instruction with Professor Margaret West, Ph.D. of Northern Illinois University. In any course in which Dr. West provides web based instruction she insists on face-to-face class meetings at various points throughout the semester. This allows the students to interact not only with each other but also to be mindful of the humanness of the educator. It allows the educator also to view the humanness of the student, who may be shy, or intimidated by either the web based instruction, or the human interaction with fellow students. In any event this human interaction provides a further development of the educational endeavor, and allows for the student to learn the intricacies of the social environment of learning. In a written response to my inquiry as to the necessity of these activities, Dr. West responded as follows:

> "In the past, I taught the course entirely online with just a face-to-face kick off and a face-to-face debrief. Feedback from students in the debriefs indicated that they were seeking more external support for avoiding procrastination in the course. They also wanted opportunities to meet with their partner for the partner consulting activity. With that feedback, I decided to add a face-to-face meeting approximately once a month. The goal of the face-to-face meetings is to provide a "check-in" on course assignments so the student paces the assignments throughout the semester, and to provide an opportunity to meet with their partner."

In having the opportunity to bring to fruition a mix of the traditional class room environment along with a constructivist educational attitude, I believe that the student will learn a great deal more than merely be left alone at the web site to learn. But I am oversimplifying a bit to make a point. The fact of the matter is that much of web based instruction includes the ability of the student to engage in forum discussions with other students, and at predetermined times with an educator leading the course of discussion. Additionally in many web site based instructional settings the student can and does frequently send e-mails to the educator or other students. But fundamentally these interactions are not human interactions. These interactions are merely a substitute for the actual human interactions that would readily take place in a traditional classroom setting.

As an example in a traditional classroom it could be stated that the educator leads the instructional process in somewhat of a behaviorist viewpoint if the educator uses the lecture technique as his sole means of instructional delivery. If however this same lecturer engages the students in the lecture, and encourages them to participate or to make other contributions to the lecture, it could be said that the educator utilized a constructivist approach to learning.

Certainly there are numerous other theories of instruction that could possibly demonstrate arguments on either side of this thesis. As an example, lets briefly consider problem centered learning, within the element of web based instruction. One of the most noteworthy educators of our times, Dr. Thomas M. Duffy of Indiana University and Unext.com is a strong proponent of problem centered learning in a web-based environment.

While I certainly do not possess neither the education, the credentials, or even the experience to argue this point with Dr. Duffy, I believe that I can respectfully suggest at a minimum that problem centered learning on the web, may not be suitable to every student. Once again, without human intervention and the social implications and benefits that this type of interaction provides to the student, the student may eventually find themselves lost in their ability to intellectually engage in the most simple of arguments or discussions.

Aside from the normal fears that some students have relative to their ability to function within a PC environment, what other fears may exist if we enroll this student in a web based course to which he may possess little or no knowledge, and then "throw her to the wolves" using a problem based scenario? I fully realize that even in a problem based scenario there are on-line resources available to the student including chat forums, additional reference materials, and even periodic and timely assistance and feedback by the educator. However, without having any academic knowledge of the subject matter, coupled with a possible fear of the PC environment, within a problem based scenario, with little or no in-person intervention available would appear to me to be a situation that would have a high likelihood of failing to meet the learning objectives of that particular course of study. Even if specific learning objectives were met and determined to be successful, have we not failed to provide the student the type of human interaction and socialization that may assist them overall in their vocation? Why would we want to place a student in the position of potentially passing a course of web-based instruction, but not learn the art and beauty of social interaction and behavior?

On the positive side most web-based instruction does provide discussion forums, discussion groups and e-mail capability. I do believe that we can definitely enhance the students' ability to write philosophically and intellectually as a result of these forums. I also believe that using these forums will indeed enhance the educational benefit of web based instruction, but not necessarily to the same extent that web based instruction coupled with human interaction could.

Conclusion

The real solution to the issue of a changing paradigm is in the answer to the following question. In which ways can web based instruction bring both the best instructional process to the student, as well as bringing about the convergence of a stimulating and encouraging environment of learning while meeting learning objectives? Is a shift in paradigm necessary, or are what we are experiencing merely a juxtaposition and congruency of the instructional design principles of Gagne, coupled with the principles and practices of either the behaviorist and constructivism approaches to learning?

Is or will it ever be possible for us as a society to provide the same type of interaction that takes place in classrooms via web based instruction? If so will we loose any of our abilities as educators, or will web based instruction create more clearly defined challenges and obstacles to the educational process? Will web based instruction be able to take advantage of alleviating distances between the masses while still being in a position to provide a quality education, or will web based instruction fall by the way side as merely a technology fad that was temporary at best?

With little research or empirical data and/or analysis available on this topic or of the effectiveness of web-based instruction to accomplish learning objectives, we can all pontificate and engage in this type of hyperbole. My own personal belief is that a combination of the tried, tested, and scientific principles of instructional design and educational pedagogy must be employed in order for web-based instruction to succeed. I don't believe that under any circumstances should proven instructional principles be sacrificed in order to serve the masses more efficiently. I do believe, however that in order to succeed with the same or exceedingly difficult goal of increasing the benefit of the educational experience to the student, that a new type of web based design principles and pedagogy will emerge. I also believe that a new type of instructional delivery system will continue to emerge and evolve as a result of technology advances and convergence in the way of cameras, video, and real time conversations. I believe a new type of educator will also emerge. This will be an educator who has had the experience of teaching in a traditional classroom setting but is able to take advantage of the technology to bring forth a better delivery method of instruction within a web based instructional setting. This will be an educator who believes that personal intervention within a web based environment is not only necessary for the student, but also for the educator and indeed will provide a valued sociological benefit to both.

Is web-based instruction a suitable alternative for all subjects, for all students, and/or for all institutions? The unequivocal response to this rhetorical question is of course not. Each of us possesses certain behaviors, skills and attributes, which allows us to learn. We are as different in these processes as the night is from the day. Web based instructional methods are only a single source utilized to expedite instruction. Some students will continue to use the services of a traditional institution, coupled with web based instruction, while other students will be more suited to the rigors of a traditional classroom situation.

Will we require making a committed and concerted effort in a paradigm shift? I am not certain that a complete shift in tried, and tested philosophies and paradigms is as necessary as is the fundamental approach to education which is to recognize the uniqueness and differences in style and learning patterns that distinguishes us as human beings and students. Only with the acceptance of these learning differences can we as instructional designers, and educators utilize the technology resources to reach the masses. Only with this recognition of differences will we be in a position to challenge and to establish new paradigms of instructional philosophy. Only with the recognition of these differences will we establish and possibly redefine the instructional philosophies, which currently exist.

Time, experience, technology and the dedication of educators and students to attempt new methods of delivery and instruction will be one of the bases of foundations for any new or re-configured paradigms that may come into existence in the future. The evaluation of these success and/or failed attempts coupled with only the passage of time will eventually allow us to effectively evaluate the changes necessary to determine if a shift in educational paradigms, philosophies, and dogma are required to suit the information age.

In any event, we as educators are very fortunate indeed to be involved on the "cutting edge" of a distance learning evolution and revolution! What an exciting opportunity for each of us to participate in a new paradigm ideally suited to this new and ever changing technology as well as meeting the needs of the student and society. What an exciting time to be involved in the educational process and in the future development of intellectual stimulation, inquiry, and argument using advanced technology.

Literature References

- Book References

Anglin, Gary J. (1995). Instructional technology: Past present and future. Englewood, Co: Libraries Unlimited, Inc

Bothamley, Jeffifer (1993). Dictionary of theories. Detroit, Mi: Gale Research International Ltd.

Gagne, Robert M., Briggs, Leslie J., Wagner, Walter W. (1992). Principles of instructional design. Fort Worth, Tx: Hardcourt Brace College Publishers

Heinich Robert, Molenda Michael, Russell, James D., Smaldino, Sharon E. (1996) Instructional media and technologies for learning. Upper Saddle River, New Jersey: Prentice Hall

Toffler, Alvin (1980). The third wave. New York, New York: Bantam Book in association with William Morrow. & Co., Inc.

Webster's encyclopedic unabridged dictionary of the English language (1996). New York, New York: Random House

- Journal References

Microsoft In Higher Education Newsletter (On-line) (February, March, April 2000) Subscription available at: http://www.microsoft.com/education/hed/signup.asp

Kaleidoscope of Designing, Administering and Teaching Distance Education

Designing Web-based Education Program

Victor Aluise
Communication, Computing & Technology, Teachers College
Scholastic Inc.
568 Broadway, NY, NY USA
valuise@scholastic.com

Abstract: A program of online courses has been designed by Thirteen/WNET to meet teacher needs relating to the effective use and integration of the Internet in the K-12 classroom. Courses in the program are predicated on action, on learning by doing. Courses are built around hands-on activities, that allow participants to experience and reflect on the topic under consideration..

Online courses define a new methodology that uses the unique aspects of the Internet and is consistent with a constructivist model of education.

- Rather than using a traditional lecture based model, courses are designed to encourage students to discover and create knowledge, and apply that knowledge to real-world situations.
- The instructor acts as a facilitator. Rather than being the expert from whom students must learn, and by whom students are led through a predetermined set of facts, the instructor's role is to encourage and facilitate students' creation of their own body of knowledge, and to comment on, assess, and provide feedback on what students have discovered and created.
- Students learn from themselves and each other, through experience, collaborative processes, critical thinking, and problem solving.

At the culmination of each course, students will have a new set of resources and strategies that they can use immediately and effectively in planning and teaching their classes.

Program Design And Methodology

Although it makes use of some tried and tested concepts (for example, required class participation and the completion of assignments), the methodology of the courses transposes them into a new learning environment.

- In seeking to utilize a constructivist methodology, courses are designed such that students' contributions to a course will form a new body of knowledge to which they can refer and from which they can build further knowledge.
- The creation of an online community of learners, committed to the goals of the program is crucial. Participation in discussion forums, evaluating and responding to others' ideas and comments, and contributing to the creation and discovery of knowledge is axiomatic.
- Although there are broad outlines and deadlines for the course, participants can work through each course at their own pace and schedule participation at times that are convenient for them.
- Each course in the program will offer audio and video elements, featuring clips from the Thirteen/WNET series, The Internet in Action.

Course Components

Before the start of a course the instructor will be invited to devise and submit **INSTRUCTOR'S NOTES.** These notes will provide participants with guidelines on the instructor's learning theory, and how she or he intends them to interpret and use the course materials.

TUTORIALS are divided into three sections. Participants are guided through the topic in a sequence of **Explanation** (tell), **Demonstration** (show), and **Implementation** (think/strategize). Each tutorial culminates in an **Assignment** (do). Participants are then asked to reflect on the tutorial's content, in offline journals and in the online discussion area.

In **Explanation,** some of the big picture, general issues involved with the topic are presented. **Demonstration** takes a Web site or project that exemplifies some of the issues introduced in the first section of the tutorial and examines those issues in context. And in **Implementation**, participants are encouraged to think about what they are learning. We will frame strategies that can be used by participants in determining how, why, where, and when they will put these theories and skills into practice.

Each tutorial ends with an **Assignment**, which offers participants the opportunity to test new knowledge and try out new skills. Assignments are focused, specific, real-world tasks. Whenever possible, participants can choose to center the activity around a specific subject and grade level, thus personalizing assignments and making them as relevant and valuable as possible.

The results of each assignment are submitted online to a document called **CLASS FINDINGS**. At the end of each tutorial, this document functions as a summary of what participants have learned, as well as a collection of participant created resources. The instructor will read and summate participants' submissions, provide a commentary on them, and select two or three "tips of the week." All participants will be able to read all submissions, in addition to the instructor's commentary.

Posting to a **DISCUSSION FORUM** is required in addition to submitting results of the activities to the Class Findings. Throughout the course, participants are encouraged to reflect on the processes they undertake by keeping a **REFLECTIVE JOURNAL** and posting excerpts from that journal online. Participants will post to the discussion forum at least twice a week during the course -- once to share a journal excerpt, and once to respond to another participant's posting. Links to the discussion forum appear on every page of the tutorial, and in the Implementation section, topics for reflection are suggested. The reflective journals themselves can be kept using pen and paper, or a word processing program.

Throughout the course, participants will refer to a variety of **ONLINE RESOURCE MATERIALS**. These materials will be developed from wNetSchool content, the Internet in Action video series, and other rich and diverse sources. Resources will be primarily text and image based, with the inclusion of audio and video where available and appropriate. Online resources will be supported and supplemented with print and video materials.

Seven Pointers for Administering K-12 Distance Education Programs

Elsie M. Szecsy
Division of Education and Behavioral Sciences
Concordia College, Bronxville, NY, USA
ems@concordia-ny.edu

Abstract: This paper reviews seven aspects to consider when administering K-12 distance educational programs and draws from the author's experience as an administrator in a distance-learning program in a metropolitan area in the northeastern United States. This paper also suggests indirectly that administrators (1) take advantage of distance education to promote new and more effective pedagogies and (2) draw from sound practices in pedagogy, professional development, and organizational design that will support them in efforts to improve distance educational programs.

Distance education is one of a number of terms that refers to instruction where teacher and learner are separate from each other and where telecommunications technology is the bridge between them. Administering distance education programs requires creative leadership in ensuring that educational goals and needs of students are met by establishing policy, procedures, and programming components ahead of time (Majdalany 1999) that is well grounded and also flexible enough to accommodate changes in technologies, personnel, and curriculum and instructional practices over time. This paper proposes seven pointers for administering distance educational programs.

Arrange as much as possible in advance. Before program implementation, administrators should establish clear organizational arrangements, policies, and procedures, especially with reference to such areas as budgeting and finance, scheduling courses and special events, reporting grades, and recording attendance. Further, administrators should also be instructional leaders, and reframe perceived insurmountable problems into opportunities to introduce instructional innovations in the broader distance educational context where they may be easier to understand. For these and other reasons it is important that organizational and operational arrangements be spelled out in advance among existing partners, and be equitable and inclusive enough in design to ensure that all voices are heard.

Recruit faculty early. Building institutional and organizational capacity begins with the early identification and recruitment of prospective teleteachers. As technology has the ability to magnify both the best and worst of teaching, administrators should also concentrate their efforts on helping newly recruited and continuing teleteachers learn and refine the best of instructional practice. Ongoing and multi-faceted professional development (including, e.g., peer and cognitive coaching, reflective dialogue, workshops, conferences; independent learning, large group demonstration, independent and assisted practice, hands-on labs), also considered optimal for face-to-face teacher development, is an especially good mechanism to ensure progress for teleteaching (Harris 1995; Lieberman & Miller 1999; Sparks & Hirsch 1997, Szecsy 1999).

Network, network, network. As important as the physical network infrastructure is, so also is the inter-institutional and interpersonal network of relationships in distance educational initiatives. For school administrators, this means communicating with one's colleagues in the other schools or districts throughout the course of the school year to facilitate distance educational programs that they share. For project administrators, this means taking a facilitative posture and resisting the urge to micromanage. Model the use of distance educational technologies by using them to facilitate networking. Providing an interactive website and using email to support networking activities are ways to accomplish this goal (Szecsy 1999).

Technically possible does not mean institutionally or organizationally permissible. Though it may, for example, be technically possible to record classroom interactions, it may be impermissible because of arrangements and existing policies or laws that preclude recording, especially where minors are present. Likewise, it is important to consider copyright law when analyzing licensing requirements for multimedia resources to be used in the distance-learning classroom.

A distance education course that takes place in more than one site constitutes one section of that course. Though apparently self-evident, when the administrator understands the distance education class section to be one class section that takes place in more than one location simultaneously, the administrator may also understand licensing requirements for multimedia instructional resources and special requirements for staffing support personnel differently from another who interprets a multi-site distance educational environment as separate groups tethered together by technology and a teacher. The difference between the two perspectives may appear slight, but their implications for pedagogy and policy are profound.

A distance educational course that takes place in more than one site requires more planning and preparation than a face-to-face course. This reality should be factored into the teleteacher's teaching load. Allowances in a teacher's load should be made to offset the additional load associated with adjusting existing syllabi or developing new ones, and preparing for and teaching via distance learning technologies.

Use multiple means to evaluate distance educational programs. Because of the complexity of distance education programs, augment traditional quantitative, empirical, evaluative mechanisms with qualitative, naturalistic inquiry methods, such as focus groups, interviews, observation, and journal writing. Program evaluation methods should address the following: accountability, effectiveness, impact, organizational context, and unanticipated consequences. Administrators are also advised to consider the following categories of information when evaluating distance learning programs: measures of activities (e.g., number of courses, students), measures of efficacy (course persistence, workload, registrants in multiple distance-delivered courses), measures of program aims, measures of policy (market research), and measures of organization (evidence of procedures and other organizational features) (Woodley & Kirkwood 1986).

Conclusion

Though the uninitiated may consider the distance education classroom to be peripheral to the larger school community, the opposite may be a better description of the place of distance education in K-12 educational programs. Astute distance educational administrators who recognize this possibility are well positioned to leverage the power of distance education to support sound, research-based curricular innovations and effect long-lived improvements in teaching and learning across the larger school community to benefit all students. In constantly changing conditions, however, making long-lived arrangements to institutionalize distance education into the educational program in K-12 settings may appear elusive.

References

Cyrs, T. (Ed.) (1997). Teaching and learning at a distance: What it takes to effectively design, deliver, and evaluate programs. New directions for teaching and learning, 71. San Francisco: Jossey-Bass.

Cyrs, T. & Conway, E. (1997). Teaching at a distance with the merging technologies: An instructional systems approach. Las Cruces, NM: Center for Educational Development, New Mexico State University.

Harris, J. (1995). Teaching teachers to use telecomputing tools. The ERIC Review, 4 (1) 2-4. Washington, DC: Educational Research Information Center.

Lieberman, A. & Miller, L. (1999). Teachers - transforming their world and their work. New York: Teachers College Press.

Majdalany, G. & Gainey, S. (1999). Implementing distance learning in urban schools. ERIC Digest. [Online]. http://www.ed.gov/databases/ERIC_Digests/ed438338.html.

Sparks, D. & Hirsh, S. (1997). A new vision for staff development. Alexandria, VA: Association for Supervision and Curriculum Development.

Szecsy, E. (1999). Distance-delivered professional development: A preliminary report. Gale's American Education Annual, 1998, pp. 283-98. New York: Book-Builders.

Woodley, A. & Kirkwood, A. (1986). Evaluation in distance learning. Paper 10. Bletchley, England. Institute of Educational Technology, Open University (ED 304 122).

Learning American Sign Language at a Distance

Pamela I. Furline
Hempstead Public Schools
Hempstead, NY, USA
pfurline@optonline.net

Abstract: This paper reviews strategies to consider when designing and implementing a foreign language devoid of voice using distance learning and draws from the author's experience as an American Sign Language (ASL) Teacher in a distance-learning program in a suburban area in the northeastern United States. This paper will also address the planning, development, implementation and adaptation needed to foster a successful program as well as the role and responsibility of hosting a distancing learning course.

Distance learning can be defined simply as any live interactive class in any classroom, which enables the transmission and/or receipt of such class utilizing technology and involving students, and teachers who are separated by time and space. American Sign Language (ASL) is the language of the Deaf community created for and by Deaf people (Baker & Padden, 1978). It is visual-gestural. ASL is a complete and complex language, with all the nuances and subtleties of a spoken language. Because of its signed modality, people often assume that ASL is merely a gestural representation of English. It is not. ASL differs from spoken languages in that it is (1) visual rather than auditory and (2) composed of precise hand shapes and movements. Although ASL is not derived from any spoken language, nor is it a written language, it coexists with English in a bilingual environment (Wilbur, 1987). Teaching a foreign language devoid of voice using distance learning requires innovative planning to ensuring that educational goals and needs of students are met by establishing a professional working relationship with the guest school(s) administration and personnel who will be instrumental in the success of the interactive processes.

Planning, developing and implementing. Implementing a distance-learning course requires time, support enthusiasm for, and belief by, administration, faculty, parents and students as well as careful planning. A distance-learning course that takes place in more than one site requires more planning and preparation than a face-to-face course. Distance learning requires clear planning to benefit the needs of the students enrolled. The Host school must develop a working relationship with the participating schools. It is important to establish guidelines and standards at the beginning of the course. Once these procedures have been established and understood by all, the class should be ready to begin on their new and exciting journey. However, they must remain flexible enough to accommodate unforeseen changes or problems with the technology used for the course. It is important that the teacher understands the technology's strengths and weaknesses and is able to adjust plans in case of technical failures. Course materials should be sent before the start of the course to ensure a smooth beginning. Effective teaching at a distance is the result of preparation as well as, parents', students' and administration's understanding of the special requirements necessary to ensure a successful course of this magnitude.

Goals and Benefits. One of the goals of learning American Sign Language (ASL) though distance learning is to help student develop cultural awareness, cross-cultural adjustment skills and respect for the Deaf community while sharing their experiences with a diverse student population outside of their individual communities. Learning ASL at a distance has contributed to the breakdown of prejudices that have divided many communities in this suburban area. Interacting with students from such a diverse background has helped to develop healthy competitions and personal relationships among the students as well as the staff. Each school strives to exceed the others skill level of performance in ASL.

Adaptation. As stated previously, ASL is a language devoid of voice that requires students to use a different sensory modality than the traditional auditory modality. These students are hearing and must now adjust to using their visual as well as kinesthetic/tactile modality to be successful in this course. Voice is not allowed and therefore, students must use different strategies to facilitate communicate effectively. The recommended mode to communicate is by using facial expressions, body language, mime, gestures, and writing notes to be placed on the television screen. This adaptation encourages creativeness and critical thinking among students.

Role and Responsibility of the Host School. Communication is the key to a successful program. The interpersonal relationships in distance learning initiatives means that communicating with the technical assistance assigned to the course as well as administrators from the other schools throughout the course of the school year to facilitate communication is essential to the success of the program. The Host school is responsible for facilitating effective communication among all schools involved in the course. They are also responsible for submitting progress reports and grades to the guest schools as well as supervising the technical assistant assigned to the course and maintaining classroom discipline. Establishing good working relationships with the technical assistances assigned by the guest schools is of tremendous importance. The relationship developed is of critical importance to the success of the course. Using the teamwork approach helps to ensure that the basic needs of the course as well as the adaptations can be met in a timely fashion. Unfortunately, because of budgetary constraints, it is not always possible to meet the technical assistance assigned and/or have a run through before the course actually begins. Oftentimes, during class it is necessary to give instructions to the technical assistant so that adjustments can be made that enhances the flow of the course.

Conclusion

Distance learning presents many new options for learning foreign languages. The electronic classroom is the wave of the future that is here to stay. In an effort to assist student learning, support from administration, faculty and staff, and also the communities involved, is essential for the success of the program.

References

Baker, C., & Padden, C. (1978). American Sign Language a look at its history, structure, and community.
Silver Springs, Maryland: T. J. Publishers
Kerka, S. (1996). Distance learning, the Internet, and the World Wide Web. ERIC Digest (Online)
http://www.ed.gov.databases/ERIC_Digests/ed39521.4.html
Majdalany, G. & Gainey, S. (1999). Implementing distance learning in urban schools. ERIC Digest. [Online].
http://www.ed.gov/databases/ERIC_Digests/ed438338.html.
Ray, C. (1990). Foreign Languages and Distance Education: The next best thing to being there. ERIC (Online).
http://www.ed.go/databases/ERIC_Digests/ed327066.html
Wilbur, R. (Ed.). (1987). American Sign Language & Applied dimension
West Lafayette, Indiana: A College- Hill Publication
Willis, B. (1992). Strategies for Teaching at a Distance. ERIC Digest (Online)
http://www.ind.net/distance_ed/ipse/fdhandbook/mst_d.html

TEACHING WEB-BASED DISTANCE EDUCATION COURSES

Sheila Kieran-Greenbush
Communication, Computing & Technology, Teachers College
Academic Information Systems
Columbia University, NY, USA
sheila@columbia.edu

Abstract: This paper addresses the issues concerning teachers of web-based courses, drawing on the author's experience teaching graduate-level and professional development web-based courses. Teaching online requires well-planned administrative and instructional support from areas such as a library. Teachers need to explicitly state their expectations and responsibilities as well as those of the learners. Teachers must allocate time to prepare and maintain and design course materials and regularly check what is happening during the course. Text-based online courses increase the demand for new communication skills.

"Distance Education is defined as a planned teaching/learning experience that uses a wide spectrum of technologies to reach learners at a distance and is designed to encourage learner interaction and certification of learning" (University of Wisconsin-Extension, 1999). The "planned teaching/learning experience" consists of social interactions (Bellack, 1966) within the created learning environment. The teacher's role is to develop, guide and ensure the "planned learning experience."

For over a hundred years, teachers and learners have engaged in distance education using postal mail service to exchange course materials and communication. Today, the World Wide Web (web) is creating new ways to engage people in distance education courses through interactions with the course content and other participants. Teachers must adapt established teaching techniques, share their role as *teacher*, and adjust communication techniques because of the design of the web-based course and the online communication methods (e.g. electronic mail, chats and bulletin boards). In addition, teachers need to have well-planned and accessible administrative, technical and instructional resource support.

Time Allocation. As with traditional courses, teachers design their courses and activities. For new web-based courses, the course materials and all the activities must be developed and prepared for delivery via the web prior to the beginning of the course. For existing courses, the materials and links to web resources must be reviewed for currency, accuracy. Teachers must allocation time to each offering of a course for course develop, review and maintenance. Once the course starts, the teacher must be available on a regular basis. Being available means accessing the web-based course on a regular schedule, daily, every other day or once week. Teachers must make the commitment to regularly respond to students' questions and comments, guide online discussion, start new discussions, and provide feedback to student submissions. Teachers of distance education courses anecdotally state that teaching online requires a greater commitment of time than teaching a traditional course.

Teaching and Communication Techniques. Web-based courses are, at this time, primarily text-based with graphics. The course materials are textual documents with images and some limited use of audio and video. Instructional resources constitute referrals to other online sites often text-based and non-online resources. The web-based method of presenting course content emulates the lecture mode in the traditional classroom without the presence of a *real human being*. Communication between teacher and between learner and learner and learner occurs via typed text either asynchronously or synchronously. Communications methods such as email, chats or bulletin boards are the only means for social interaction. With no paralinguistic cues, teachers need to learn to gather the same information from the text-based communications of the course participants as they would in a traditional classroom. They must ask questions that invite discussion, risk-taking and creativity. They need to share the roles of controller and authority with all participants. The feedback they provide to learners either through submitted work or in direct communications, directly influences the learners' experience and engagement in the learning process.

Learner and Teacher Expectations and Responsibilities. Teachers and learners bring their past learning and classroom experiences to web-based distance education courses. Within the traditional view of school, the teachers are the source of knowledge pouring that knowledge into the minds of the learners. Teachers are responsible for the learners' learning, control everything else that happens in the class and assess the learning (Scherer, 1999). In this view of learning, students expect teachers to know all aspects of the content, control what happens in the class and ensure that the learners learn what is required. With distance education courses, the responsibility for the learning shifts to the learners. They must learn to schedule their own time, learn to ask for information or help and interact with the course materials and other course participants. Teachers are responsible for providing materials and guidance. They also must support the development of the learning environment and the learners' efforts, and provide feedback that engages the learners in the learning process.

Distance education shifts the emphasis in the learning environment to a student-centered environment. With this shift, teachers must employ new and adapt existing teaching techniques. They must clearly state what they are responsible for and what are the learners' responsibilities. Anecdotally, teachers report that learners expect immediate feedback. When it suits them, learners still seem to defer to the teacher as the *leader and controller*. Teachers must learn to ask questions and guide learners to accept their new responsibilities. Teachers must learn to take learners' expectations into account as well as state clearly what their expectations.

Administrative and Instructional Resource Support. There needs to 3 types of support: administrative, technical and instructional resources. Administrative services such as registration and course publicity need to be as fully functioned as they are for traditional courses. Teachers should be able to contact staff who will resolve questions regarding registration, academic advising and other student services. The staff will coordinate the technical support and administrative work, and ensure that rosters are loaded into the online course and that participant notifications occur. They will coordinate the Registrar's requirements with the online environment. Technical support functions include loading course materials and student information each semester into the online course and resolving technical issues facing students and faculty. Teachers need to be able to work with staff to understand what is doable within the online course. Teachers also need to have instructional resource support that includes help building course materials and finding instructional resources such as web sites and full-content/text resources that the learners will use.

Conclusion

Each learner is unique. Teachers must adapt their strategies and techniques to create individualized activities and plans that engage and motivate each learner. In web-based distance education, the technology adds new dimensions and demands on teachers to develop student-centered learning environments. With only a small body of literature available on effective teaching in this new learning environment, we can learn much from each other.

References

Bellack, A., Kliebard, H. M., Hyman, R. T. & Smith, Jr., F. L. (1966). The Language of the Classroom. Teachers College Press, NY.

Scherer, M. (1999). The Understanding Pathway: A Conversation W ith Howard Gardner. Educational Leadership. 57(3). 12 - 16.

University of Wisconsin-Extension. Definition of DE. Distance Education Clearinghouse [Online], http://www.uwex.edu/disted/definition.html.

Exploiting and Evaluating A Web-Based Learning System
Six Days and Seven Nights In The Basement

John Knight
Department of Philosophy
University of Wisconsin-Waukesha
United States
jknight@uwc.edu

Robert Bermant
Department of Psychology
University of Wisconsin-Waukesha
United States
rbermant@uwc.edu

Abstract: Discussion of the value of Web-Based Learning System (WBLS) takes place at two levels, the theoretical and the practical. The practical value of a WBLS depends on numerous factors including: extent of course enhancement, degree of dependence on web-based technologies, the software platform, technology support, students skills, and institutional issues. At the theoretical level the debate on the value of a WBLS occurs both within the discipline as well as within academia itself. This report examines our experience with a WBLS in the context of a new integrated studies course.

We teach at the University of Wisconsin-Waukesha, a two-year transfer institution within the University of Wisconsin System. It is a commuter campus without residence halls. Most of our students work at least twenty hours a week. Over half of our students are from the lower quartiles. Faculty at our institution typically teach 12-credit hours each semester and in addition they are expected to contribute in a variety of ways outside of the classroom, i.e., student advising, committee service, and professional activity.

The institution provides office computers, network access and a web-based learning system (WBLS) for its faculty. While significant dollars are targeted toward the development of on-line, asynchronous courses, there few institutional resources allocated for web-enhanced courses. This despite the fact that the faculty is expected to develop and support web-based activities for their courses in addition to their other professional and pedagogical responsibilities, i.e., "six days and seven nights in the basement."

Furthermore, instructors on our campus have little technological support. For example, our computer center staff is unable to assist either instructors or students having problems with a WBLS or other instructional technologies. Technology assistance is the responsibility of a limited-term employee, who is a half-time student at another campus. Needless to say, much of time the instructor is left to his or her own ingenuity to figure out the solutions to technical problems. These problems range from helping students login to the system, to discovering why the colors they have chosen for their personal web pages look different when they view them at home. The upshot is that at the beginning of the semester we devote many hours to wrestling with these problems while at the same time trying to prepare for and teach the course itself.

Currently, there is really little merit recognition for including web-based activities into our courses. Rather, it is largely a matter of instructor choice. And that choice may be driven more by institutional priorities than by compelling research demonstrating the soundness and efficacy of web-based pedagogies. Although there is ample evidence that students "like" web-based experiences, important questions about the educational value of such experiences remain unanswered. Does more technology mean better pedagogy? Just because we can now put materials on the web and provide virtual discussion forums for our students, should we? The problem is we simply do not know. It seems that such questions ultimately focus on resource deployment. When much of what we do or do not do is driven by enrollment, it is important to determine how to allocate limited dollars. Do we invest in technological infrastructure, while encouraging the deployment of web-enhanced, hybrid, and asynchronous courses? Or do we support opportunities for greater student-faculty contact, smaller classes, and first-rate teachers. Obviously these choices are not mutually exclusive, but the tension they engender is very real and it has implications for our future as an institution as well as for our students.

A primary motivation for integrating a WBLS into courses is course enhancement. There are several ways instructional technologies can enhance a course. Clearly they encourage interpersonal communication. Discussion forums, group activities and email permit asynchronous exchanges to occur. Student and faculty home pages help in getting to know something about each other. In the absence of opportunities for face-to-face interaction a WBLS can help to foster communication among students and faculty.

However, our aim in using the web is not communication for communication's sake. Rather we want our students to present clear, coherent, and consistent arguments. We seek to accomplish this in three ways. First, we try to be role models. We provide examples of the kind of analysis we expect. Whether we are presenting our own views or discussing the views of another philosopher or psychologist we emphasize the importance of justifying our conclusions. We provide hypertext links to sites that exemplify empirically based and logically sound arguments. Second, we ask students to evaluate each other's arguments. And third, we take the arguments presented on the course web site back into our classes to stimulate discussion. This is especially helpful where we have students who don't say much in class. We use their web comments to get them involved in the face-to-face discussion. The technologies used in our courses also enable us to demonstrate the richness of resources available on the web. Not only do we provide supplementary course materials but external links as well. As we discuss each main topic we provide students with a set of hypertext links that elaborate on the issues. Often the links are directly to the authors who write the articles or to discussion groups currently analyzing the concepts and arguments. Along with web discussions we also present self-check quizzes. The quizzes receive a fair amount of attention. Students will often have follow-up questions about their answers. Thus web-based instruction not only aids in teaching our courses but enables us to tutor the course as well.

Web-enhanced courses present unique involvement challenges. It is difficult to motivate student to participate in web projects without grade inducements. We have offered courses that have included web components where the web work was not required for the class grade. While there was initial interest, the web activity dwindled as the semester progressed. In fact, according to class surveys, one of the student's greatest concerns about web work is the time it takes. Since most of our students have jobs and many have family obligations, they must carefully budget their time. When we first integrated web work into an interdisciplinary course, we received a lot of student complaints about what they perceived as excessive work. In response to these concerns we have since cut down on the web requirements.

In large classes it takes a fair amount of time to read, record, and respond to the answers to discussion questions. We estimate that in addition the start-up time, web work adds about one hour each day per class. In order to track students' responses to their web experiences we conduct continuous student evaluations throughout the semester. We ask students to keep logs as well as having them fill out questionnaires. The tracking information is very useful in spotting problems, making mid-course corrections, and insuring that our web demands are not excessive.

There are a wide-range of philosophy and psychology courses at all academic levels now offered on-line. Additionally, there are electronic journals, articles, papers, opinions, and discussion forums on the web. Our professions have certainly embraced the web as a vehicle for exchanging information. The sheer quantity of information is overwhelming and often this makes it difficult to find a useful signal in what sometimes seems little more than a sea of random noise. Within the disciplines there is debate over the advantages and disadvantages of web v face-to-face instruction. Do on-line courses tend to negate the dynamic interaction needed to teach philosophy and psychology? Would Socrates ever teach an on-line course? Can one "deliver" instruction as if it were a pizza? Are courses that are taught on-line better than no courses at all? Fortunately value-added or web-enhanced courses need not answer these questions, although they beg for answers. Instead, we believe that we have the best of both worlds. We interact in-person with our students. Also we exchange ideas with our students over the web. We can take advantage of the richness of information that the Internet makes available, while preserving and celebrating the face-to-face interaction of the classroom. Most of our students are not well adapted to the demands of independent study. For them and for us as well, value added learning technologies provide another means for reinforcing and enriching in-class instruction.

Are We There Yet? A Journey Through Distance Learning

Jerrie Jackson, Ph.D.
School of Education and Clinical Studies
Our Lady of the Lake University
United States of America
jackj@lake.ollusa.edu

Jean Kueker, Ph.D.
School of Education and Clinical Studies
Our Lady of the Lake University
United States of America
kuekj@lake.ollusa.edu

Scott Walker, M.A.G.
School of Education and Clinical Studies
Our Lady of the Lake University
United States of America
walks@lake.ollusa.edu

Abstract. Three years ago, the journey of utilizing a distance-learning format for offering coursework began with a low-tech instructional arrangement which we termed "two cans and a string". Technology has continued to be integrated in courses through software application such as PowerPoint, Internet sites and course management software such as Blackboard.com. We are now beginning to offer multiple point-to-point courses over ISDN lines using VCon videoequipment. This session will discuss key points to consider when making decisions about equipment, connectivity, infrastructure and money.

The teacher shortage in the United States is causing many teacher preparation programs to become more creative in how people can become certified. The demand for well-qualified teachers is even greater in rural and inner-city school districts. One solution to increasing the number of certified teachers is to make the access easier to certification courses. Distance education courses can accomplish this; however, the quality of the program must be maintained (Hara & Kling, 1999). Many of our courses require two-way interaction. We agree with Simonson (2000) who promotes the equivalency theory of distance education. That is to say that distance education is a formal, institutional based education that takes place using two-way interactive telecommunication systems. As sited in Simonson, Smaldino, Albright, and Zvacek (2000), Simonson states:

> It should not be necessary for any group of learners to compensate for different, possibly lesser, instructional experiences. Thus, those developing distance education systems should strive to make equivalent the learning experiences of all students no matter how they are linked to the resources or instruction they require.

In the Spring of 1998, the Special Education program at Our Lady of the Lake University began our first videoconferencing efforts. With a computer loaded with NetMeeting, a microphone, and an $80 camera at each location, we were able to set up a "low-tech" videoconference classroom at a minimal cost. The teaching site, on the OLLU campus, used a computer, camera, digital projector, and a wireless microphone, while the remote location used a computer, camera, and microphone set up in either their school's conference room or library. The total cost to outfit three existing computers with cameras and microphones was $550.

The university computer was connected by 100 MB Ethernet to a LAN that was ultimately connected to the Internet. The remote computers were also connected to the Internet via LAN; thus no modems were used. Of significant note, however, is that the school districts involved use the same Internet Service Provider (ISP) as the university, thus they are all directly connected to the same router at the ISP, and the conferences did not actually go out onto the Internet.

With the initial success of the point-to-point, low-end videoconference delivered classes we decided to aim expand on our initial success (plus we got a bigger grant) and move to a high-quality (30 fps), medium-bandwidth (384kbps), multi-point videoconference scenario to deliver several classes to multiple locations.

Technology investment and connectivity control the limits of many types of distance education instruction. Each strategy must be considered in relation to the kinds of bandwidth, development hardware, and receiving equipment it needs. In many cases, instructional strategies born of high-end technical laboratories can be modified to sell sophisticated settings. We do not have a $250,000 classroom that is "the videoconference room" with a lot of equipment, monitors, and other electronic "bells and whistles".

We are a small Catholic university. We have a limited budget with limited staff to support videoconferencing. Yet, we must extend our teacher preparation program to communities surrounding San Antonio, especially the rural school districts.

Our teacher preparation program has non-traditional components, including evening and weekend courses, but this does not reduce travel time from remote communities. Videoconferencing is a viable solution, but we still must look for cost effective solutions. Classroom space must be multi-purpose: face-to-face teaching, as well as videoconferencing. We have spent $14,000 for the university classroom videoconference set up and $8,000 for each remote site. Connectivity will also cost approximately $40,000 for nine ISDN lines running at 128kbps, plus one PRI.

This presentation will discuss decision making points: a) equipment options including issues of format (PC based or hardware), expandability, portability, b) infrastructure support (H.320, H.323, and ATM), c) connectivity issues (ISDN, T1, and IP); and d) money. A detailed Request for Proposal with videoconference specifications as well as the videoconferencing project design can be found at http://education.ollusa.edu/site_2001.

Administrators and advocates often promote technology, but true adoption and implementation occur because faculty are not given time, equipment and training (Cuban, 1996). We have the equipment; we are providing the training and release time. We are not there yet, but we are further down the road, and the way is clearer.

References:

Cuban, L. (1996). Teachers and machines: The classroom use of technology since 1920. New York: Teachers College Press.

Hara, N., & Kling, R. (1999). Student frustrations with a web-based distance education course. *First Monday*, 4 (12), at http://firstmonday.org/issues/issue4_12/hara/index.html

Simonson, M., Smaldino, S., Albright, M. & Zvacek, S. (2000). Teaching and learning at a distance: Foundations of distance education. Upper Saddle River, NJ: Merrill.

Acknowledgements: Financial support for videoconferencing equipment is provided through a Department of Education Title II Teacher Quality Partnership grant.

Benefits and Problems of Asynchronous Online Electronic Mail Forums

Kevin C. Lee
Department of Communication
West Virginia Wesleyan College
lee@wvwc.edu

Abstract: The use of structured listserv assignments is an effective means of generating quality on-line discussions regarding selected readings for text-based courses. Observed benefits of the listservs will be described by focusing on three representative cohorts of student communicators who participate in the forums. Building on the instructor's experience of using listservs successfully for several years, this paper explains the how and why of structured listserv discussions and provides suggestions based on course experiences.

Introduction

The use of structured listserv assignments is an effective means of generating quality on-line discussions regarding selected readings for text-based courses. Observed benefits of the listservs focus on three representative cohorts of student communicators who participate in the forums. Building on the instructor's experience of using listservs successfully for several years, this paper will explain the how and why of structured listserv discussions and provide suggestions based on course experiences.

Description

Using listservs set up by campus computing services, the instructor posts a series of questions regarding a reading assignment for the following week's class sessions. The questions should address matters of interpretation or opinion rather than strictly factual information – "why?", "how?", etc. rather than simply "what?" Students complete the reading assignment at their own pace, then log on and respond to the questions. Sometimes they will pose some related questions.

To receive full credit, students are required to 1) make specific reference to material in the readings by using quotations, paraphrases and citing page numbers; and 2) make specific reference to answers from students who have already responded.

Benefits

Observed benefits of the listservs can be described by focusing on three cohorts of student communicators: quiet, overbearing, and typical.

a) Quiet Students – Shy, reticent students often are terrified to speak up in class, even though they may have wonderful thoughts that could contribute to the course. The quiet student will, however, respond to structured listserv questions because these assignments are graded. Shy students also will respond because they don't have to physically face a whole classroom of fellow students and the professor. A number of the quiet students prove to be quality thinkers and their on-line contributions prove to be very valuable to the life of a particular discussion and to the atmosphere and direction of the course itself.

b) Overbearing Students – The compulsive classroom talker, the speak-before-thinking blurter, and the off-task amateur comedian are much less of a problem on-line than in a traditional "live" setting. They have one shot at answering each set of questions, just like everyone else. Also, they cannot interrupt or intimidate others who are contributing. If they come up with something inappropriate on-line, other students seem much more comfortable letting them know that digitally than shouting across a hushed classroom.

c) Typical Students – The average students communicators -- who view classroom communication as something less than thrilling, but hardly terrifying — benefit in several ways from structured listserv discussions. First, they are prompted to actually read the material prior to class so that they can participate in the on-line discussion and not lose points toward their final grade. And unlike in-class quizzes, their answers are for all of their peers to read. So, they may read more closely for comprehension because – even on-line -- they do not want to make an embarrassing mistake in front of their classmates. Because of peers, the writing quality also may be improved.

Lastly, all students benefit greatly from the opportunity to read insights/ideas from their fellow students and to engage in amicable debate on the issues raised by the assignments and by their fellow students.

Challenges and Responses

Challenges and responses include the following: the first person can't reply to others (however, the same person is rarely first more than once); shy students may be shy on-line too (at least they are writing something); occasionally a student can be rude on-line (tell them you are forwarding a copy to the dean); some students generally just repeat what has already been said (at least they are reading the original thinking of others, writing something coherent, and benefiting from the repetition of cogent comments).

Conclusion

Course listservs can by used by any classroom instructors seeking to use on-line discussions to facilitate quality discussions on required readings and expand the reach of the class beyond the time/space restrictions of the traditional learning space.

The two primary intended outcomes for this information include: 1) that instructors will have an introductory understanding of how to create successful structured listserv discussions for selected courses; and 2) that they will be aware of some of the potential benefits and challenges of this teaching strategy.

The Distance Teacher: The Ultimate Distance Learners

Karen A. Lemone
WPI
United States
kal@cs.wpi.edu

Abstract Distance learners have been increasingly under the microscope as teaching technologies have enhanced to include web-based courses and universities. Predictors of student success have been researched, tools created to enhance communication, thousands of courses put online, and assessments developed to show both success and comfort of students with web-based learning. Instructors share some of the same advantages and disadvantages as do students as well as some not shared by students. Little has been developed to predict instructor success or comfort. We analyze features commonly attributed to be assets and liabilities of distance learning for students and describe, from six years experience, their impact on instructors. We describe problems instructors do not have in common with students. We summarize results of a survey from students at the end of a distance learning class who were asked to describe features an instructor of distance learning classes should have.

Introduction

The traditional model of a web-based distance learning environment shows an instructor delivering a course to students who are scattered. However, if a time element were added to this picture, we would find that instructors may also be scattered: at the office, the airport, home, the summer home, a conference, an Internet cafe in Bangkok. The author has been in all of these places and others - grading, recording, monitoring and responding to bulletin board posts.

In this paper, we analyze features commonly described on distance learning web pages to be assets and liabilities of distance learning for students and analyze whether these are true for instructors. We describe features of distance learning that are particular to the instructor. Finally, we summarize results of a survey from students – some successful, some not - from a distance learning class who described necessary characteristics for an instructor of distance learning classes. From these we draw some conclusions.

Features of Web-based Distance Learning Course sites advertise and studies corroborate the following features of web-based distance learning for students. For each of these, our analysis for the instructor version has been added.

No travel to class Presuming the student has the necessary equipment where he/she wants to study, travel is not necessary. The time spent in class can be devoted to more focused learning. Also, students who are not within commuting distance can take a class they wouldn't otherwise have access to. Or if they live nearby, they needn't worry about class time conflicts. And finally, self-motivated students have always been able to learn independently, and this is a real benefit to them.

> **For the Instructor** The same is true about travel - in fact, the ability to be able to travel is a definite motivator. Being able to attend the entire session of a conference without having to rush back in order not to miss too many classes makes this mode of delivery very attractive for instructors.
>
> But it takes more time to prepare and deliver a distance learning class than to do it live, in class. Answering questions when both the questioner and the answerer are physically present takes less time to resolve the ambiguities inherent in the question-answer dialog. Written words take more time.

Flexibility This is the most common "advertisement" on course web pages, but unless the course is self-paced (many are not), due dates are still due dates. Of course the student can access the materials in the middle of the night, but the same can be said for textbooks. Few courses have the staffing to monitor the bulletin board at 2:00 a.m. In most cases, flexibility means no class (see "No Travel to Class" above) and the ability to access the materials when the student wishes to.

> **For the Instructor** As long as the materials are ready when the syllabus tells the student they need them, they can be prepared at any time. But isn't this true for in-class courses? Also, that which is flexibility for the student (asking a question at 2:00 a.m.) is hardly flexible for the instructor or staff member who may be expected to answer it.

World-wide access to experts and colleagues This is a particular asset for discussion type courses where students can converse with someone from another country and/or culture. A discussion of events at Pearl Harbor would be different if some of the students are Japanese and some are American. For motivated students, searching for supplementary material increases their learning. In fact, students who are motivated to search for answers are enabled by the web.

> **For the Instructor** This is a major benefit for the instructor of web-based courses in general and distance learning web-based courses in particular. In one of our courses, our Hypertext module uses the material (with the author's permission) of a leading expert in the field. Instructional "reuse" is an emerging pedagogy.

Class size A recent study [Institute for Higher Education Policy, 2000] found that class size did not affect quality of online distance learning courses. But studies [Lemone, 1997, 1999] show that class size does affect comfort, however. A study of a class of 30+ students compared to the same course taught with ten or fewer students showed much more anguish. The questions: "Did the staff respond in a timely manner" and "Did the instructor appear to care about the students" received lower scores in the larger class. More students in the larger class indicated that they would not like to take an online course again.

> **For the Instructor** Attempts to measure the time/student vary, but for instructor-led (as opposed to instructor-produced) courses, it is clear that class size does affect instructor success (if measured by course evaluations.) In addition there is a great increase in instructor time even when the course includes other staff to help. For the 30+ class, (taught just once because of the time involved) we joked that there is an exponential relation between class size and instructor time and work. Further studies may show it is no joke.

There are many other features for instructors that can be studied, measured, and compared with those for students: collaboration ease, assessments, management of communication tools and course content, to name a few.

Pretest and Posttest Surveys

The information presented here was gathered from one term of a yearly web-based distance-learning course. The information received is consistent with that gathered in previous years, and from larger classes. Not shown are specific statistics taken week by week, and statistics related to course content.

TIME

Distance Learning takes more time for students and instructors. Below is a comparison between the time students *expected* to spend (Figure 1), and the time they actually did spend (Figure 2).

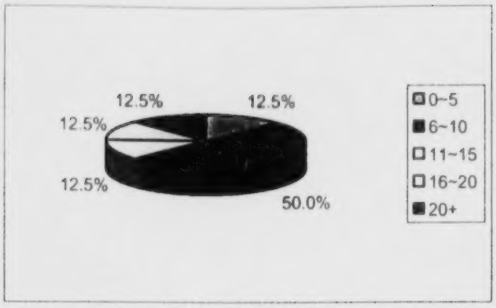


Figure 1 Hours planned to spend/week on course (before course)

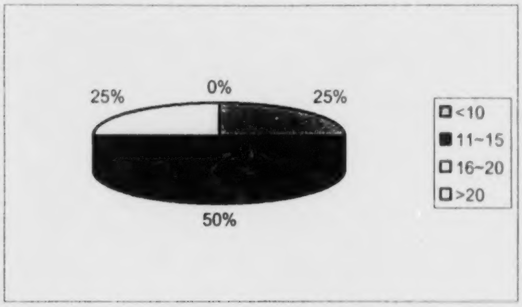


Figure 2 Hours actually spent/week (after course)

Statistics gathered during the course showed that half the class spent 16 or more hours for three of the ten weeks the course was in session, with 25% of the class spending more than 20 hours during two of the busiest weeks.

WEB USE

Students who already use the web to find information might be expected to be more comfortable in a web-based distance learning course. The one student who got a C (the rest of the grades were A's and B's) indicated that he found information best from an instructor.

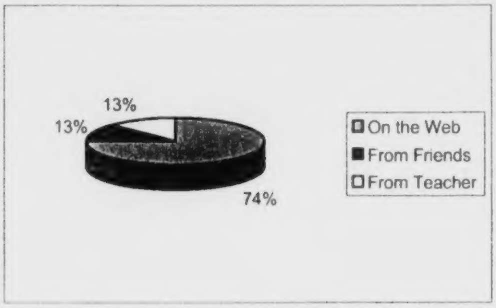


Figure 3 How do you find information?

The amount of time spent on the web also indicates their comfort in this medium. Only one person (the student who received the C) spent fewer than 5 hours per week on the web.

EXPERIENCE IN DISTANCE LEARNING

Students who have taken a distance learning course before might be expected to be more comfortable, and to be better able to gauge their success, but as Figure 4 shows, few have taken distance learning at our university so far.

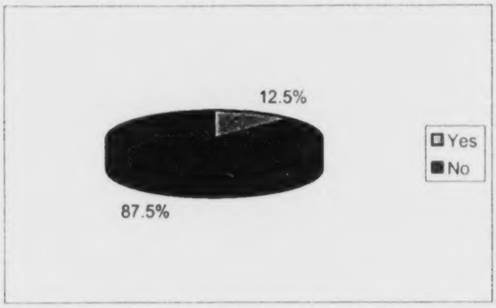


Figure 4 Have you taken a distance Learning Course before?

WEB-BASED AGAIN?

The students were asked if they would take a web-based learning course again. Figure 5 shows that most, but not all of them would like to do so.

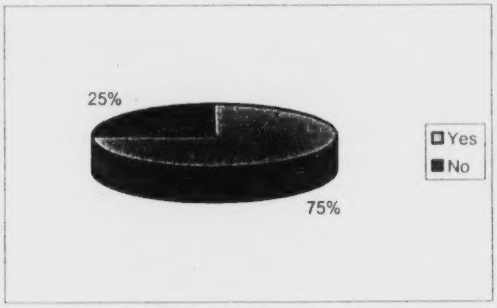


Figure 5 Would you take a web-based online course again?

CAMARARDERIE

It is important for students to feel a sense of connection to both the instructor and to their classmates. For web-based learning courses, this is facilitated both by the instructor and by the use of web-based communication tools. Figure 6 shows that the course could improve in this area.

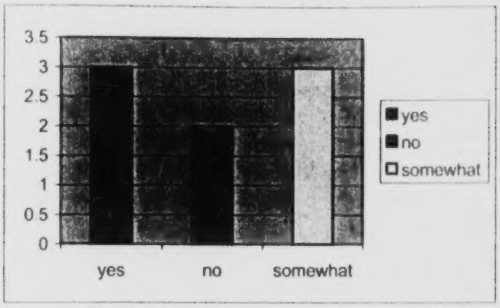


Figure 6 Feel a sense of camaraderie?

The students were also asked questions that allowed free form answers.

STUDENT CHARACTERISTICS

Prior to the course, we publish a list of characteristics found to be predictive of success in web-based distance learning. In an attempt to further refine these, the students were asked after the course for their opinions. They listed many of the same characteristics plus a few of their own: interest in material, self-disciplined, motivated, comfortable learning outside the classroom, comfortable on the web, self-directed (able to search for information), able to keep to a schedule, able to work independently and isolated, be a full-time student (referring to the amount of time the course took), not easily distracted, not needing close attention and one-one attention, not needing physical contact with instructor and classmates, no procrastination, no interfering family responsibilities (for those who work at home),

Students were asked what behaviors enhance web-based learning.

HOW TO ENHANCE WEB-BASED LEARNING

The students mentioned: interacting with other students, being self-disciplined - starting new material early, not to expect spoon-feeding, having a good computer environment, and an easy way to print materials (acknowledging this is hard with hypertext).

What Students Want in a Web-based Distance Learning Instructor

Studies have shown that only those instructors motivated to do distance learning should be encouraged to do so [Institute for Higher Education Policy, 2000]. Those interested and involved in distance learning need to present courses that students can learn in and are comfortable with. The students reported the following characteristics and behaviors needed by such instructors: display correct and concise information, understand that no matter how clear the content appears to be, students will always have questions, respond to questions and requests in a timely manner, respond immediately to bulletin board postings, have good course organization, attend to the course's "portal", have patience (needed more than in-class), be responsive.

While many of these also apply to traditional in-class courses, it is likely they are even more important when the course is entirely web-based.

Analysis, Results and Conclusions

Web-based distance learning courses involve two aspects: 1) course content, and 2) course communication. The World Wide Web itself provides a platform for the content. Course management tools provide the communication, both asynchronous (bulletin boards etc.) and synchronous (chat rooms etc.).

Web-based courses are not an easier way for students to learn, just a convenience in some cases. Clearly, it takes more time to learn in such a course. All students spent more time than they predicted. For the instructors it is also not easier, but also sometimes more convenient. Experience has shown that using the model where the course creator is also the instructor takes the instructor more time than traditional courses, and that the time tends to be more fragmented due to the asynchronous communication features of course bulletin boards. In the statistics, one student requested 24-hour instant response to bulletin board postings. While this may seem unreasonable in a traditional course setting, perhaps it is not unreasonable in a web-based course.

The student characteristics and behaviors, as reported by the students themselves, include some traditional ones: motivation, interest in the subject, avoidance of procrastination etc. But they also include some not needed by traditional students: ability to be physically isolated, no need for one-one interaction etc. While the physical isolation is real, we would question some of the others. Students shouldn't *feel* isolated. Course management techniques and perhaps virtual styles yet to be developed should enable students to feel they are part of the class – a sense of connection. Facilities for one-one interaction need to be further developed: if the written word is too ambiguous in a situation, emerging interactive technologies should be used.

Although the course described here was entirely web-based, we do not necessarily believe this should be the case. Combining technologies via video tapes, video streaming, and other interactive technologies will increase both the learning and comfort of those at a distance. In addition, web-based distance learning need not replicate the classroom. Rather it needs to develop its own pedagogy which enables learning in its own way.

References

Bernt, Frank and Bugbee, Alan (1993) *Study Practices and Attitudes Related to Academic Success in a Distance Learning Programme*, Distance Education, Volume 14, Number 1.

Goodfellow, Robin (1999) *Expert, Assessor, Co-Learner: conflicting roles and expanding workload for the online teacher*, in Proceedings of CAL99.

Institute for Higher Learning Policy, (2000) *Quality on the Line: Benchmarks for Success in Internet-Based Distance Education.*

Lemone, Karen (1999) *Web-based Teaching Tools: Addressing the Paradigm Shift*, presented at Plenary Session of ComCon 7 in Athens, Greece.

Lemone, Karen (1999) *Real Instructors Don't Go to Chat Rooms*, in Proceedings of WebNet 99, Honolulu.

Lemone, Karen (1999) *Experiences in Distance Education: the Authoring Dilemma* in Proceedings of EdMedia '99, Seattle, Washington.

Lemone, Karen (1997) *Experiences in Virtual Teaching*, in proceedings of WebNet '97 in Toronto, Canada.

Lemone, Karen (1997) *Assessment of Tools for Virtual Teaching* in proceedings of Enable '97 in Finland

Lemone, Karen (1996) *Retargetable Course Generation: A Methodology for Reusability in Distance Education*, in Proceedings of Workshop on Architectures for Intelligent Tutoring Systems, ITS '96, Montreal, Canada.

Mason, Robin (1998) *Models of Online Courses*, ALN Magazine, Volume 2, Issue 2.

VIDEOCONFERENCING IN PRACTICUM OF EDUCATIONAL STUDIES.

Jukka Mäki, University of Oulu, Finland
Department of Educational Studies and Teacher Training
Faculty of Education
University of Oulu, Finland
jmaki@ktk.oulu.fi

Abstract: This paper presents the use of ISDN-videoconferencing in practicum of teacher training at the University of Oulu in Finland. A special emphasis is given on music education explaining the problems and experiences of teaching music in VC-environment. Music lessons have more complicated difficulties than a normal VC-lesson, because for example a teacher cannot show the pupils from up close the instruments. But the ISDN-technology even helps the teacher in many ways. Experiences of a distance education project at Utsjoki School in Lapland are explained thoroughly and presented with videotaped-material of lessons.

1. The Finnish degree system

The student at a Finnish university studies a Master's degree which can be completed in five years (160 study weeks). Before this he can obtain a Bachelor's degree (120 study weeks). Following the Master's Degree studies there is also an optional pre-doctoral postgraduate degree of licenciate, which can be completed in two years of full-time study. Studies for a doctorate take approximately four years following the Master's degree. [www.oph.fi; www.minedu.fi].

2. The University of Oulu

Oulu is a city of 112.000 inhabitants located in Northern Finland, close to the Arctic Circle [www.ouka.fi]. It is well-known in the field of business and advanced technology. Founded as recently as 1958, the University of Oulu has grown rapidly, establishing itself as one of the leading universities in Finland. About three quarters of the 13 000 students come from the two most northern provinces of Finland: the Provinces of Lapland and Oulu. Approximately 1700 new students enroll at the university every year. The University staff consists of 1400 lecturers and researchers.

2.1. The Faculty of Education

The University of Oulu has five Faculties: Education, Humanities, Medicine, Science and Technology. In addition, the University embraces a number of independent departments, such as the Thule Institute, the Center for Continuing Education, the Computer Services Center and the Language Center. [www.oulu.fi].

The Faculty of Education specializes in Educational Sciences and Teacher Education [wwwedu.oulu.fi]. There is also an international Master's degree program. The disciplines represented by the Faculty are educational sciences, psychology, educational psychology, social sciences and music education. There is a special Unit for Educational Technology [edtech.oulu.fi]. The Faculty of Education has a 10-year tradition and experience in distance learning covering now all of the Northern Finland and Lapland.

The Department of Educational Sciences and Teacher Education offers studies of Kindergarten teacher, Elementary school teacher, Music Teacher and Subject Teacher for comprehensive and secondary schools.

2.2. The Practice of Teacher Training

The Oulu Teacher Training School belongs to the Faculty of Education in the University of Oulu. The school consists of 2-level comprehensive school (primary school and lower secondary level) and upper secondary school with its own school district. The teacher trainees complete their practicum in these Training Schools but also in other schools of the municipality of Oulu and in village schools which often are located far away. Many students choose a part of practical training using videoconferencing in order to have an extended knowledge of telematics-teaching. [norssi.oulu.fi].

The curriculum of teacher training determines the amount of training hours for teachers in the Training School and in the remote schools. The practicum is divided into five modules during the years of studies. Most of the practicum is done at the Teacher Training School, whose aims are also to experiment new methodologies and innovations in education. Because many remote schools have equipment for videoconferencing and also experience of using that, most students have a possibility to practice teaching at distance.

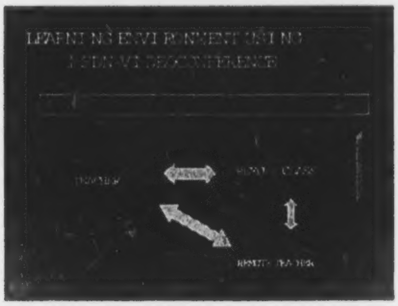
2.3. The Department of Music Education

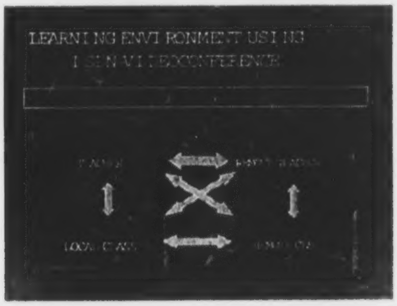
The University of Oulu is one of the three universities in Finland providing subject teacher education in music teachers for comprehensive and secondary schools. The goal of the music education program is to provide the student with skills, information and attitudes required in widely and autonomously taking care of tasks in music education as well as developing the work and scientific aspects. The student is familiarized with the goals, contents and protocols of music education as well as with the application and observation of pedagogic music research. [musicedu.oulu.fi].

Essential points of emphasis in studies are amongst others music and communication technology. All students take part in learning of distance education -methods, lesson planning, using videoconferencing and creating www-material for music lessons.

The Music Department has taken a leading role in developing and integrating the music education in Northern Finland. Cooperation has been done between schools, institutes of music and the Department. Some projects have been done by the members of the staff but mostly in cooperation with the students. Thus all the partners - professors, students, distance teachers and students in institutes and schools - have had important and unique experiences in music education by distance.

3. Models for teaching in ISDN-videoconference environment





A teacher with a remote class. In the first model a local teacher is alone conducting the lesson with the remote class. There might also be a teacher, but in many cases in scarced villages there are no special teachers for all the subjects of the school curriculum. Even the pupils take care of the of the facilities and the classroom discipline. More often there is however a teacher as a technical tutor, but he may not have any knowledge of the teaching subject. The local teacher has the main responsibility of teaching.

Two classrooms simultaneously. In the second model a teacher is conducting the lesson with the local class and the remote class together. There may also be a remote teacher or a tutor. If the remote teacher is familiar with the teaching subject, the responsibility of teaching can be divided between the two teachers. The interaction and communication goes on between all the partners. [musicedu.oulu.fi/koti/jmaki.htm].

BEST COPY AVAILABLE

4. Utsjoki-project

Utsjoki is a good example of activities that has been done using videoconference in teaching and as part of the practicum of teacher trainees.

Utsjoki is a village with 1500 inhabitants and it is situated in the very North of Finland on the Norwegian border [www.utsjoki.fi]. The municipality has three villages which are located tens of kilometers from each other. Each of them has a school of own but only with few pupils. Without VC-technology the pupils could not receive all the lessons of the comprehensive school program. The main school in Utsjoki has also upper secondary school. Many students of Lower and Upper Secondary School of Utsjoki are brought with taxi from a distance of 50 kilometers or more and some pupils remain every school week in Utsjoki returning home only for the weekends.

4.1. Background to the Project

In the early 90's there were first experiments of distance learning using Tele-X-satellite and later ISDN-lines. There also existed need for distance medical services and so there was interest in different level of municipality. Other villages in Lapland, technological institutions, universities, state and province became partners in the project, too. Because of the long distances from cultural centers and scarce teacher resources, videoconferencing has given new aspects for education.

The Utsjoki-project started in 1995 as preliminary preparation. Experimenting, research and establishing period was implemented in 1996-1999. It had financial support from the Finnish state, European Social Fund and European regional development Fund-project. Because of the excellent results, the Project-application with videoconference was continued until July 2000. [www.utsjoki.fi/~utspoli].

Most of the activities have taken place in the lower and upper secondary school. The main goal of the Utsjoki-project is to create and develop learning methods and networks that increase educational equality and utilize the decreasing resources of the schools. The networking of schools both inside the Utsjoki municipality and with other municipalities in the Lapland region makes it possible to combine the scarce resources of education providing the schools with further possibilities to exist.

4.2. Practicum of distance teaching for teacher trainees

The Teacher Training School of Oulu University [norssi.oulu.fi] started distance education in 1994 first with few villages and later with many schools in Northern Finland. Utsjoki participated as remote school the following year. Lessons were offered in languages (English, German, French, and Swedish), in mathematics and sciences (theoretical physics, chemistry and chemistry laboratories from a distance) and even in astronomy. For instance there were four pupils for the German group in Utsjoki and two in Karigasniemi (100 km). The groups were united and so there was a possibility to start lessons given by teachers and students from Oulu (800 km far away).

In many cases it is far more economical to organize distance lessons rather than to bring pupils with a taxi to the school. And it is far more economical.

Teacher trainees, who participate in teaching from distance, usually also visit the remote schools for the some period. The experiences have been positive, because they can meet the pupils face-to-face. After this the interaction is closer, because the TV-star comes to them live as one pupil expressed. On the other hand, many pupils say that "the teaching is the same whether the teacher is present or not". Often the learning and the results, according to research, are even better in distance learning, because pupils must concentrate more on the instruction and teachers are better prepared for the lessons.

When having a period of face-to-face teaching the teacher trainees became acquainted with the facilities more of the remote school. That's why, according to the experiences, if planning to implement distance teaching it is advised to start with visiting the remote school and meeting the pupils and other teachers.

Some problems have occurred when shy pupils don't want to talk to the camera and so the distant teacher has difficulties to contact them. But there are different reactions, namely many shy pupils have been encouraged more in communication when they can see themselves in the screen. Pupils, who have short attention spans, have naturally problems also in distance lesson.

Research done on distance mathematics studies has shown that it is possible to reach equal results in both distance and actual education. In Utsjoki even distance studying in chemistry class in a laboratory course has been experimented. First the pupils in a chemistry group of the upper secondary schools were taught the basics in laboratory working by their own actual teacher. During the six last lessons of the 38 hours unit pupils had an opportunity to follow instructions in Oulu University's chemistry group, where four students were taking their first year examination in chemistry.

4.3. Teaching music from distance

The Utsjoki School had a music teacher last time 15 years ago and so the pupils had no possibility to have music lessons. The use of ISDN brought a music teacher in the classroom and the pupils were enthusiastic with the instruction. The lessons were instructed from the University of Oulu, the University of Helsinki [www.helsinki.fi], Music University Sibelius Academy in Helsinki [www.siba.fi]and the Institute of Orivesi [www.kvs.fi]. The learning environment was developed to create a similar as a normal classroom face-to-face teaching.

The lessons consisted of teaching history and theory of music, singing and solfege, rhythm instruments, rock band instruments, ensemble playing and pupil presentations.

Teaching with two-way videoconferencing has major problems with the limited possibilities of sound and picture which are more emphatically in teaching music. The main role is the quality of sound and picture. Using one ISDN-line (128 kpbs) a delay of 0.5 seconds occurs. It doesn't sound very much and in normal communication (speaking) it doesn't bother us at all. But that delay is very big when making music with remote class – it's even impossible to sing and play simultaneously. When there are in use two ISDN-lines (256 kpbs) or three (384 kpbs) and the lip synchronization is adjusted, the delay is so minimized that the human mind doesn't even notice it.

There are no differences when teaching theory or history of music from a distance or face-to-face. The teacher is able to use all the written and acoustic material plus the internet and application sharing. Also pupils are able to work in groups, present their exercises and teamwork with the same way as in normal classroom situations. Distance lessons give more possibilities for collaborative and self-directed learning and pupils come more responsible for their own learning, because they must be active participants in the learning process.

Learning to play instruments and ensemble playing meet some problems in teaching. When a pupil is learning guitar, the teacher cannot go next to him and show where to put his fingers. He must explain verbally but he can zoom his camera close to his own hands. This is even better than a classroom situation where a pupil tries to see from the distance of several meters the finger placement. So there comes a question: is distance teaching actually "close-teaching"?

The teacher can always show the rhythms with his own guitar. The same happens with teaching the drums: he shows how to play and pupil imitates. In face-to-face situation the teacher is able to take the hands of a pupil and play together with him. This cannot happen in distance lesson. But again one advantage: quite seldom there are two drum-sets in one classroom – during distance lesson the teacher can play together with pupil and the teaching is more practical.

Because music lesson has always quite high amount of decibels, the teacher and the learning group must agree some practical rules: when and how to start and finish, in which way the teacher interrupts the playing etc. Because the sound is delivered with microphone, the distant teacher might not hear all the details. That's why it's good to use more than one microphone and place and direct them in a proper way.

The modern videoconferencing technology also gives the teacher also the possibility to zoom the remote camera. So he is able to follow closely the performance. Furthermore he is able to play MIDI-instruments together with the remote group. If the teacher also has a classroom with him, they become really versatile jam-sessions between the local and remote pupils. The distance has no borders: one group in Finland and the other group in Australia – making music together!

The critical point in teaching music with ISDN-videoconference is the excellence of planning of the lesson. The teacher must prepare everything very well: the lesson plan, all the music to be listened, to written examples of partitures, transparencies, instruments, VC-equipment – everything must be physically close to him. And he must always be flexible to change his good lesson plan in case of technical problems. A remote music teacher must be a "super-teacher". A good music teacher also uses other means like the internet and email which supplements real-time teaching. Often fax, post and even telephones are useful and necessary ways of communication.

The evaluation of the learning sometimes quite complicated in music lessons. The teacher doesn't always see or hear all the pupils and that's why the participation during lessons is not always well recognized e.g. when they're singing together there might be problems to separate the voices. If there is a tutor or remote teacher, the evaluation is possible to do together. Often the atmosphere during the lessons is not conveyed via ISDN. After every lesson it's good to have a feedback discussion between teachers – and also pupils can tell their thoughts. In the case of the Utsjoki-project it was even more essential, because part of the lessons were instructed by the remote tutor (teacher of physics). Those lessons were however planned by the music teacher and the pupils in turn reported about the lessons to him.

5. The future

The most northern village of Finland, Utsjoki, is creating for its pupils more activities and various learning situations than a normal city-school with the help of videoconferencing. The Utsjoki-project finished, but continues its co-operation with the Povilus project, which is a joint project of 12 Finnish municipalities and the University of Oulu. In September 1999 teachers of those municipalities were given updating training in Oulu and this included 7 teachers from Utsjoki. The future will show what kind of co-operation the network project will create.

In addition to remaining as a remote school for teacher trainees, the Utsjoki school has videoconferencing with other schools, institutes and universities in Finland. One cooperative school is The Ziridis School in Athens, Greece [www.ziridis.gr]. Pupils of both schools have had numerous authentic learning experiences together and they have learnt a lot of culture, history, tradition, way of life etc. of the two countries. And most importantly: the pupils are able to communicate in real-time and learn from each other – although in Utsjoki there might be -40 degrees Celsius and at the same time +40 degrees Celsius in Athens. Both remote ends of Europe.

Links in www

[edtech.oulu.fi] *Research Unit for Educational Technology*. Department of Educational Sciences and Teacher Training. University of Oulu, Finland.
[musicedu.oulu.fi] *Music Education*. Department of Educational Sciences and Teacher Training. University of Oulu, Finland.
[musicedu.oulu.fi/koti/jmaki.htm] *Home page of senior researcher Jukka Mäki*. Music Education. Department of Educational Sciences and Teacher Training. University of Oulu, Finland.
[norssi.oulu.fi] *Teacher Training School*. Department of Educational Sciences and Teacher Training. University of Oulu, Finland.
[www.helsinki.fi] *University of Helsinki*, Finland.
[www.kvs.fi/kvs/orivesi.html] *Institute of Orivesi*, Finland.
[www.minedu.fi] *Ministry of Education*, Finland.
[www.oph.fi] *National Board of Education*, Finland.
[www.ouka.fi] *City of Oulu*, Finland.
[www.oulu.fi] *University of Oulu*, Finland.
[www.siba.fi] *Sibelius Academy*, Helsinki Finland.
[www.ziridis.gr] *The Ziridis Schools*, Athens Greece
[www.utsjoki.fi] *Municipality of Utsjoki*, Finland.
[www.utsjoki.fi/~utspoli] *Telematic distance learning -project in Utsjoki*, Finland.

Desktop Video Conferencing:
The Optimum Solution for Synchronous Distance Learning

Ronald McBride
College of Education
Northwestern State University
United States
mcbride@nsula.edu

Frank Fuller
College of Education
Northwestern State University
United States
fullerf@nsula.edu

Robert Gillan
College of Education
Northwestern State University
United States
gillan@nsula.edu

Abstract: Technologies for teaching at a distance are expanding rapidly. Though web-based delivery, using the computer and Internet, has attracted substantial interest recently, other technologies, like full motion video compression, continue to provide alternatives to the Internet. Factors such as quality of delivery, cost effectiveness and convenience of operation have shifted the emphasis away from high cost video compression systems. Nonetheless, web-based classed taught at a distance provide significant coverage but lack components such as full frame video that allow students to see the teacher during synchronous delivery. The essence of "real-time" instruction is simulated with DVC, though at a fraction of the cost of video compression systems. Desktop video conferencing synthesizes the best features of all distance learning delivery systems, resulting in a technology that provides a variety of applications for the participating institutions. This paper explores desktop video conferencing as the "next generation" distance learning technology, comparing faculty and student preparation time, initial and maintenance cost, and effectiveness of instruction.

Introduction

The technologies for teaching at a distance continue to proliferate. Though web-based delivery, using the computer and Internet, has attracted substantial interest recently, other technologies, like full motion video compression, continue to provide alternatives to the Internet. Desktop Video Compression provides a middle ground between traditional video compression and text-based Internet. Factors such as quality of delivery, cost effectiveness and convenience of operation have shifted the emphasis away from high cost video compression systems. Nonetheless, web-based classed taught at a distance provide significant coverage but lack components such as full frame video that allow students to see the teacher during synchronous delivery. The essence of "real-time" instruction is simulated with DVC, though at a fraction of the cost of video compression systems. Desktop video conferencing synthesizes the best features of all distance learning delivery systems, resulting in a technology that provides a variety of applications for the participating institutions.

Since this technology is not dedicated for distance learning the way video compression is, facilities serve as a computer lab when the site is not hosting DVC courses. During class time, the technology, by its nature, provides devices that assist the distance-learning teacher with the best opportunity to simulate a face-to-face environment. An essential ancillary benefit of DVC technology is the system accommodates other applications like staff development and certification training for teachers: it works for short-term training in situations where a face-to-face simulation is important. As educators make choices about accessing the world of distance learning, DVC technologies are becoming a clear choice as the vehicle to originate or receive courses from another teaching site. Either way, desktop video conferencing expands possibilities for the participating school to teach or receive classes at a distance and use the facility as a computer lab for traditional applications.

Desktop Video Conferencing as the Next Generation Distance Learning Technology

The evolution of distance learning technologies has included a wide array of delivery systems including but not limited to interactive satellite, audio graphics, audio conferencing, web-based/Internet, video compression and more recently Desktop Video Conferencing (DVC). It has been hailed as a dynamic new technology that operates in a synchronous environment and provides a high degree of interaction between students and their instructors (Mize, 1996). Yet DVC is a relatively new and emerging technology that provides cost-effective instruction under the umbrella of distance learning. Specifically, the cost of delivering instruction via distance learning using computer software and teleconferencing strategies--the profile of desktop video conferencing--creates savings in terms of money, time and resources without a substantial loss of effectiveness of instruction (Castellan, 1993). Desktop video conferencing has created more practical, less network specific distance learning opportunities than systems like video compression that cost considerably more (Ward and Lee, 1995). Furthermore, as a distance learning application it is most appropriate for individual and small-group use (Woodruff & Mosby, 1996, Chute, Thompson & Hancock ,1999). Desktop video conferencing is a technology that allows students, teachers and colleagues to interact with each other from their desks or classrooms via the Internet creating the essence of a phone conversation but with video and graphics (Googin, Finkenberg and Morrow, 1997). The design of the technology maximizes the use of its many applications like document sharing, "which allows participants to see and edit a computer document as they see and hear each other" (Furr, p. 46). Instructors use other applications like a synchronized web-browser to access Internet sites. In addition, DVC includes a "white board" which provides the instructor and student, in control of the system, a utility to write, enhance, draw, highlight and grab images to the board.

The first and most recognizable type of desktop video conferencing system is CU-SeeMe, developed at Cornell University (Fudell, Hardy and Terrell, 1997). CU-SeeMe allows students to send and receive video and audio on a computer to other participants (Todd, 1996). Companies like Vtel and PictureTel have developed desktop video conferencing systems using ProShare operating software (Johnson, 1999). Recent entries into operating software include Iline Corporation's Learnline Version 3.1 which is the system running the desktop video conferencing network at Northwestern State University, the subject of this paper. Unlike video compression technologies which use significant bandwidth, DVC operates on lesser bandwidth using ISDN or T-1 telephone lines that can be fractured for multiple sections.

There are some disadvantages however, to delivering courses at a distance using desktop video conferencing. Video and audio quality will not be as good as broadcast television or video compression. Video and audio use a great deal of space called bandwidth, which is typically not available with desktop video conferencing technologies (Googin, Finkenberg and Morrow, 1997). Comments such as "This would be great if...the video were better...the audio were better...it could mutli-point...the screen was bigger" (Johnson, 1999, p.1) are typical comments from users of first generation desktop video conferencing technologies. Additionally, users may have difficulty adjusting to live audio and video while trying to manipulate the technology like microphones and cameras to obtain optimal operating quality (Ward and Lee, 1995). Training of users may become the element that eventually neutralizes any disadvantages of using desktop video conferencing for distance learning applications.

Desktop Video Conferencing at Northwestern State University

Northwestern State University of Louisiana, with assistance from a U.S. Department of Agriculture Rural Utilities Service, created a network with 10 sites primarily located at rural schools to pursue a new direction in distance learning that is flexible, accommodates a variety of learning styles, and is synchronous but can have asynchronous applications.

Northwestern provided a good laboratory in which to test desktop video conferencing instruction, for the University had developed and used several distance learning delivery systems over the previous decade, including audio graphics, interactive satellite, web-based Internet and video compression technologies. The selection of DVC as the "next generation" distance learning delivery system was based upon years of evolution, research and practice.

The desktop video conferencing network at Northwestern State University was the answer to several problems facing the university. First, it introduced a new technology to address several challenges unique to teaching at a distance such as the need to see faces of teachers and students. Second, it provided a network where partnerships were established not out of need but necessity. Third, it afforded the opportunity for courses in a variety of disciplines without restrictions or limitations imposed by other technology. Fourth, it provided a location in each parish where students, teachers and citizens can come together and take classes or participate in training sessions. Fifth, it enabled teachers who have skills unique to a discipline to teach classes to other students in the parish and across the state using their expertise. Sixth, it served as a PC lab at the site that can be used for regular computer activities; unlike dedicated video compression classrooms and satellite studios. And seventh, it provided a low-cost alternative to video compression technology, accessible by public schools.

Faculty and Student Preparation for Desktop Video Conferencing

Student and instructors using desktop video conferencing systems typically have little difficulty using the technology. If a teacher is already a computer user, the learning curve for operating a DVC system can be relatively short (Furr, 2000). Nevertheless, as with all distance learning technologies, DVC requires time and effort for training and preparation of course materials (Mize, 1996). Some skills and technical support are needed if students are to interact with instructors using desktop video conferencing (Merisotis and Phipps, 1999).

Introduction and initial training on the system is provided, by faculty members to students during the orientation session or first class. It takes about 10 minutes to prepare students to use DVC a feat unmatched by other prevailing distance learning technologies. Desktop video conferencing systems provide a level of comfort unparalleled in the distance-learning arena. There appear to be two causes for the system's ease of use. First, the technology is a personal computer -- familiar equipment to virtually every student. However, second, the PC, configured for desktop video, is a sophisticated device with applications that enhance teaching and learning at a distance.

Since students tend to feel more comfortable with the technology, they concentrate their efforts on learning in subject areas not struggling with a technology that is difficult to navigate. When the class is not online participants use the lab for class assignments or to perform other tasks. Hence, for the first time user, a desktop video conferencing lab is less intimidating than traditional distance learning technologies and the environment more familiar as well as "user-friendly,"

Faculty prepare for DVC classes on their own time. Preparation by faculty as a first time user takes on average about 2 to 3 times longer than that for face-to-face instruction because faculty prepare their lessons using computer applications such as PowerPoint, Word and Excel. In addition, the instructor must prepare a cadre of support resources such as URLs that are presented to students online using the synchronized web browser, a utility available with Northwestern's DVC operating software. Once a course is built, it is easy to modify for subsequent delivery. In fact, most faculty believe that the majority of the effort is in preparation for a first or new class using DVC.

Initial Cost for Desktop Video Conferencing

The cost of delivering instruction via distance learning using computer software and teleconferencing strategies--the profile of desktop video conferencing--creates savings in terms of money, time and resources without a substantial loss of effectiveness of instruction (Castellan, 1993). Desktop video conferencing has created more practical, less network specific distance learning opportunities than systems like video compression that cost $250,000 to $300,000 (Ward and Lee, 1995). It is a technology that allows students, teachers and colleagues to interact with each other from their desks or classrooms via the Internet creating the essence of a phone conversation but with video and graphics (Googin, Finkenberg and Morrow, 1997). Of course, cost may vary, but a typical PC with storage capacity to operate DVC software, the cards, and audio components cost approximately $3500 per unit. Factoring in a network configuration with a server which supports several PCs regardless of their location, add another $12,000. A network with 30 PCs, configured at several sites, has a price tag of under $125,000 without the phone lines. The rates for dedicated telephone lines (ISDN or T-1) vary in cost depending if special rates are available to the institution. Monthly line charges range from $300 to $2,000 for a T-1 line. ISDN with dial-up capabilities are considerably less expensive but may limit the DVC software's performance especially when video is operating on the system.

The initial funding for the desktop video conferencing system at Northwestern State University was supplied from a grant written to the United States Department of Agriculture Rural Utilities Service in August 1997. A second grant was submitted a year later to broaden the scope of the project to include five additional parishes in central Louisiana. The College of Education was awarded a grant in 1998 to parallel the RUS project, which would essentially double the teaching and production capabilities by establishing a second desktop video conferencing laboratory on campus, but in the Teacher Education Center.

The RUS project established a distance learning facility in ten parishes (counties) to address economic and educational challenges for the people of this predominantly rural area. These include: (1) K-12 education--standard, remedial and advanced placement; (2) higher education--undergraduate, graduate, and teacher certification; (3) adult and continuing education--GED, workforce development, and life-long learning; and (4) job searching. College-level courses were planned for the network and made available to those who are time and place bound with specific restrictions that limit their ability to take classes or attend workforce training sessions. Job training and information will also be available for those making transition from welfare to work. Public school administrators will use the system to collaborate on other initiatives by face-to-face conferencing. The match for the project was 60 percent from the partnering institutions and 40 percent from the Department of Agriculture Rural Utilities Service.

The impetus for the grant was to address problems that faced the available user population from demographic data that include a rural population with a high drop-out rate of 50% to the ninth grade, 91% do not have college degrees, a large percentage of the population are classified as disadvantaged, and of those who attend college over 50% need remediation.

A second grant from the Board of Regents Support Fund, State of Louisiana, specifically addressed the need to prepare teachers for the emerging technologies such as desktop video conferencing, centeringk, thereby, the desktop video instructional program in teacher education.. The College of Education at Northwestern State University is a leader and advocate of distance learning. The grant provided the tools for training per-service and in-service teachers and administrators to use these new tools. Area superintendents expressed a concern about the infusion of technology without proper training for teachers on how to use and integrate technology into teaching and learning. They were worried the problem may compound an already desperate situation regarding the attitude of teachers and parents about technology in the classroom. What resulted from these grants was the establishment of a network that accommodates a multitude of educational and work related issues while helping to better prepare teachers for using technology in the classroom.

Effectiveness of Instruction

In addition to its pervasive coverage, desktop video conferencing conforms to instructional strategies where instructional design theories were considered. Adapting instruction to DVC produced a "best fit" atypical to most distance learning delivery systems. First, the best practice of current instruction must be preserved and renewed. Instructional and evaluative strategies that have been successful in face-to-face settings can be adapted to use with DVC to increase salutary effects with students participating from a distance. Second, the technology's instructional enhancements such as application sharing (Microsoft Word, PowerPoint, Excel, etc.), a whiteboard and synchronized web browser can be incorporated in the instructional design of the class in such a way that virtually makes the technology invisible.

Desktop video conferencing is the newest distance learning technology. As a result the amount of research available regarding effectiveness of instruction is somewhat limited. Most studies have generated qualitative regarding the attitude of students toward using DVC. The findings from a study conducted by Bell Canada and Queen's University in 1996-97 were: (1) participants were "excited" about the new technology; (2) participants needed at least a two-week period of adjustment for using the new technology; (3) participants found it difficult to take notes with demonstrations on the monitor; (4) small groups resulted in better sessions and interaction from the participants; and (5) participants found DVC to be an "informal, no pressure" mode of learning.

Cooke (1999) found that DVC instruction increased students' enthusiasm and motivation. Cooke said, "pockets of creative teachers have risen above the obstacles and found new and innovative ways for collaboration and learning through this medium" (p. 8). He noted strengths for using desktop video conferencing. They include: (1) lower costs for development and operation of classes taught using DVC; (2) students are connected from different locations and backgrounds; (3) it provides access to programs for people who might not otherwise have that access; (4) it overcomes the text-based nature of on-line discussion; (5) it enables extends the classroom such that outstanding lecturers can interact with students in their classroom; and (6) it adds a teacher presence on-line. Furr (2000) noted that technical problems, the knowledge needed to operate the system, insufficient training for faculty and participants, the lack of adequate course preparation and the difficulty of soliciting feedback and interaction were obstacles to using DVC.

Since the DVC system at Northwestern State University is in its second semester of operation there is little data to examine the effectiveness of the delivery system. Information from student surveys suggests that 48% of the students taking a DVC class for the first time would take another. Twenty-one percent said it would depend on which course was being offered which was more a function of the class and not the technology. Most of the students were willing to forgive the technical problems because they believed, "the bugs would be fixed." Finally, 90% of those surveyed were positive about the future of distance education and particularly desktop video conferencing.

Conclusion

As distance-learning applications continue to proliferate, new teaching technologies will appear. Desktop video conferencing is perhaps the first distance learning technology to grow out of the most common technology used in education, the personal computer. Network configurations for DVC are less complicated than other technologies and merge with existing systems. Providers of classes at a distance have noted that the availability of compressed video, web-based classes with applications such as video, synchronized web browsers and shared software capabilities alter instructional choices. Yet desktop video conferencing promises to provide these capabilities that were once the exclusive properties of more expensive technologies. Finally, student access to and skill with the new learning environment must be insured. Since learning with technology is predicated on some degree of learning abou*t* technology, efficient instructional systems strive to provide consistent expectations. Consequently, desktop video conferencing has the potential to replicate traditional face-to-face instruction, can access educational resources such as the web, presentation software, video and CD technologies yet has a "price tag" that is affordable.

References

Castellan, N. (1993). Evaluating information technology in teaching and learning. *Behavior, Research Methods, Instruments, & Computers*, 25, 233-237.

Chute, A.G., Thompson, MM. & Hancock, B.W. (1999). *The McGraw-Hill handbook on distance learning*. New York: McGraw-Hill.

Cooke, G. (1999). Videoconferencing and learning in the primary French immersion classroom. [On-line]. Available: http://www.stemnet.nf.ca/~gcooke/DTVC.html/DTVC1.html

Furr, Paula (2000). The occurrence o f incidental learning in desktop video conferencing courses: an ethnographic study. Unpublished doctoral dissertation. Northwestern State University, Natchitoches, LA.

Fudell, D., Hardy, D., & Terrell, G. (1997, May). *Desktop conferencing for distance education* [On-line]. Available: http://www.utexas.edu/cc/newsletter/may97/confer.htm

Goggin, N., Finkenberg, M., & Morrow, J. (1997, August). Instructional technology in higher education teaching. *Quest*, 49, 278-290.

Johnson, L. (1997) *Converting a desktop video conferencing system to classroom use* [On-line}. Available: http://www.mtsu.edu/~itconf/proceed97/mds097.htm

Merisotis, J.P.& Phipps, R.A. (1999, May/June). What's the difference? *Change*,31(3), 12-18.

Mize, C.D. (1996,November/December). Desktop video communication: A primer. *TechTrends*,41(6), 44-47.

Todd, S. (1996, September). Going global: desktop video conferencing with CU-SeeMe. *Learning and Teaching With Technology.*, 24, 57-61.

Ward, E., & Lee, J. (1995, November). An instructor's guide to distance learning. Training and Development, 49, 40-44.

Woodruff, M., & Mosby, Q. (1996). *Videoconferencing in the classroom and library*. [On-line]. Available: http://kn.pacbell.com/wired/videoconf/intro.html

Acknowledgements

The Desktop Video Conferencing facilities at Northwestern State University have been provided by the University with support by the US Department of Energy Rural Utility Service development program and the Louisiana Board of Regents Systematic Initiatives Program.

One Size Does Not Fit All: Designing Distance Education Support

Eunice M. Merideth, Ph.D.
Drake University School of Education
United States
eunice.merideth@drake.edu

Peggy E. Steinbronn, Ed.S.
Drake University Microcomputer Services
United States
peggy.steinbronn@drake.edu

Abstract: The "One Size Fits All" label is a tantalizing one. It implies that whatever the garment, it is generous enough in intent and design to fit a large individual, yet it is structured so cleverly that it would be useful for the most petite. Like taste and fit in clothing, the need for online support requires different labels that recognize and address shared and unique needs. The purpose of this presentation is to outline a plan for online support that has been implemented at a medium-sized, liberal arts university. When creating a design for this type of support, one begins with all stakeholders' shared needs of communication, servers/computer, and software to make sure that the core of the support system is firmly in place. One then moves outward to address crossover and unique needs of web administration, web faculty, and web students.

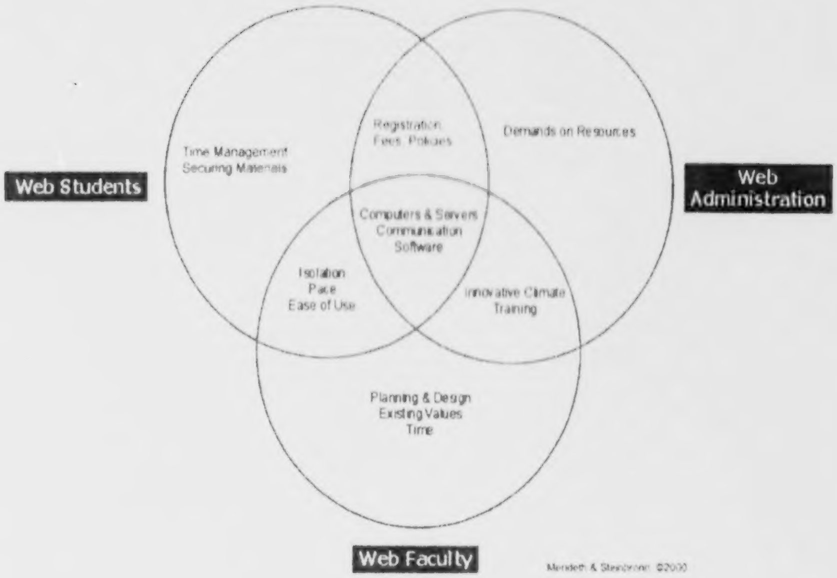
The "One Size Fits All" label is a tantalizing one. It implies that whatever the garment, it is generous enough in intent and design to fit a large individual, yet it is structured so cleverly that it would be useful for the most petite. Rarely, however, are the elements of utility and style in apparel really so flexible.

Like taste and fit in clothing, the need for online support requires different labels that recognize and address shared and unique needs. The kind and amount of online coaching that a distance learning student needs certainly varies from X-Small to XX-Large. Typically, however, student needs in distance education reflect an individual's technical knowledge of hardware and software, motivation, identification with his or her social context, personal responsibility for learning, and communication skills.

The purpose of online support is to help students start strong and stay engaged in distance learning situations. If it is successful, online support should positively impact the psychological and physical environment of teaching and learning in an electronic arena and influence the retention rate of students. White and Weight (2000) report the following reasons that students drop out or stop out of an online class: students leave because of isolation; students leave because of the accelerated pace; students leave because of competing responsibilities; students leave because of technical issues. (p. 69)

While these reasons are compelling for students, they also deserve serious consideration from a faculty member's point of view. In addition, Chang (1998) maintains that for faculty "technology must be consistent with their existing values, and there needs to be a real educational value beyond the use of technology for its own sake" (p. 1). From an administrative point of view, online support is a necessary part of doing e-commerce, but tension does exist among competing demands on resources, establishing and maintaining communication, and the strength of an institution's climate for innovation. Support services can also serve the administration of an institution by providing information about student profiles, usage patterns, and evaluation of courses.

The purpose of this presentation is to outline a plan for online support of a web-based, summer program that has been implemented at a medium-sized, liberal arts university where student-involved learning is at the heart of the mission and technology is an important part of the vision of the institution. When creating a design for this type of support, one begins at the center of the Needs for Distance Education Support Diagram (figure1) to make sure that the core of the support system is firmly in place, then moves outward to address all needs. This does not mean that support is only generated as crises occur; support for all shared and unique needs identified should be planned for or in place before the implementation of online instruction. The reality of teaching and learning in any environment, however, is that support is never static. It must continue to evolve to meet new needs.


Web Students
Web Administration
Web Faculty
Time Management
Securing Materials
Registration
Fees, Policies
Demands on Resources
Computers & Servers
Communication
Software
Isolation
Pace
Ease of Use
Innovative Climate
Training
Planning & Design
Existing Values
Time

Meredith & Steinbronn ©2000

Figure 1: Needs for Distance Education Support Diagram

Shared Needs of All Stakeholders for Distance Education Support

This outward design for online teaching/learning support begins with the shared needs of all stakeholders: communication, computers & servers, and software. Online teaching does not require less communication, but even more communication of specific information that recruits students and then keeps potential students interested. All stakeholders also need server reliability and 24/7 accessibility to be able to function in an anywhere/anytime environment as well as distinct hardware parameters necessary for success. The type of operating system, browser levels, and plug-ins needed to successfully navigate the site and comply with web software should be identified. Web education software defines the look and feel of the courses, so maintaining a balance between power of consistency and flexibility is important.

Serving a variety of stakeholders who have shared needs requires creative strategies to address different levels of need with different measures of support at the same time. Levels of support for shared needs in distance education, like a well-fitting garment, can be categorized by small, medium, and large, depending on how much support is given and the effort incurred in producing and maintaining that support. The following levels of support strategies have been designed to address online stakeholders' shared needs of communication, computer & server information, and software concerns.

Small = Place a promotional communication that is interesting but doesn't overstate the realities of web-based education, a clear description of system, browser, and word processing program requirements on the WWW.

Medium = Create web-based directions with visual aids (screen shots) for setting browser preferences and configurations with directions about how to correct any technical deficiencies. Periodic e-mails to students who have indicated interest also encourage and inform prospective students.

Large = Monitor 24/7 server accessibility and encourage the upgrading and investing in web infrastructure as well as strong hardware/software support for faculty. Electronic mailing of web course offerings and descriptions to other universities and listservs promotes registration on a more global scale.

Shared Needs of Web Administration and Web Faculty for Distance Education Support

Different levels of support are now needed in each crossover areas of need. Web administration and web faculty support needs concern the *creation of the course:* innovative climate and training. A climate of enthusiasm provides the spirit for innovation, but does not sustain it. "Support must be present in terms of funding, time allocation, technical resources, and investing in a well-trained staff" (Hsu et al., 1999, p. 98). Moreover, consistency is improved when the personnel who are training the faculty to use web software are the same personnel who will support it. Differentiated strategies of support in this area include the following:

> *Small* = Create interest and curiosity by sharing innovative online teaching and learning strategies, incite the possibility of web teaching in faculty members' minds, and motivate faculty with evidence of positive experiences and a reward system. Presentation of successful courses and different "looks" to existing courses offer ideas to faculty who are just beginning to explore distance education.
>
> *Medium* = Host workshops that offer software instruction, create and maintain a help page for faculty, use work-study student help to aid faculty in research and the technical building of the course. Small but important chores such as taking digital photos and scanning materials can be done by students, freeing the faculty to think, plan, and create.
>
> *Large* = Create and maintain a one-on-one mentoring of faculty new to the web through teams of faculty members headed by an Academic Computing Fellow or a Web Education staff person.

Shared Needs of Web Faculty and Web Students for Distance Education Support

Web faculty members' and Web students' crossover needs include isolation, the pace of the class, and the ease of use--academic and personal factors in *maintaining the course.* These needs are both physiology and psychological, so their impact on teaching and learning is substantial. Hatcher and Craig (1998) acknowledge these needs and warn, "this isolation can lead to a de-humanizing of the learning experience" (p. 4). Obviously, then, special care must be taken to design and support the ease of use of course materials and interactivity between students and faculty in a distance-learning course. Chickering and Ehrmann (2000) find that this is not only possible, but interactive communication strategies can actually empower students: "The World Wide Web increases opportunities for students and faculty to converse and exchange work.... Total communication increases and, for many students, the result seems more intimate, protected, and convenient than the more intimidating demands of face-to-face communication with faculty" (p. 1). Different levels of support to further these worthy goals include the following strategies:

> *Small* = Publish an introduction to the course and a short online syllabus at least two months before the beginning of the class. This preview allows students to understand the workload of the class and to obtain textual materials prior to the first day of the class. The online introduction and syllabus also focuses the faculty member's continuing web course design, so that her/his course is not created ad lib.
>
> *Medium* = Help faculty members design different types of assignments to create interest and use class management tools to increase efficiency. Assisting faculty in the use of management tools so they may enter grades, post to portfolio files, and provide feedback, contributing to a positive virtual classroom climate for both students and faculty.
>
> *Large* = Build Instructor-Student and Student-Student communication structures to calm frustration and enhance learning for everyone involved. The technology that allows faculty to specify communication-rich assignments (team projects, required discussions, "guest speakers," peer editing or peer presentations with responses) is available. However, this level of Internet use will call for increased support because it also implies difference avenues for completion of these assignments, and a longer learning curve. These interactive types of assignments are more time-consuming than simple read and response assignments; however, they also lead to better exchanges and greater opportunities for learning, even for the instructor.

Shared Needs of Web Students and Administration for Distance Education Support

Web Students and Web Administration crossover needs center around registration, admission and withdrawal from classes, fees and refunds--matters of *beginning the course.* Like any processes that involve money and credits, these should be as quick and direct as possible. Explicit requirements of online courses may require changes or adjustments in administrative policies that govern traditional courses. On campus and online courses share a concern about the type, sequence, and outcomes of courses needed. Online support in this area requires clear and clever communication that both advertises and informs. "These students expect a high level of customer service. They want their needs to be anticipated, immediately addressed, and courteously handled"(Klor de Alva 2000, p.37). Different strategies seek to reduce confusion and create a positive climate even before the course begins.

Small = Establish registration procedures that ensure a fast turnaround and confirmation of class placement. Once committed to the idea of learning online, students want to know that they are confirmed as a member of a web course.

Medium = Create a library resource launch page that facilitates easy access to electronic resources. This page should facilitate the student's entry into electronic databases and provide hyperlinks to electronic checkout and acquisition of materials.

Large = Publish and maintain an up-to-date web page which clearly states institutional policy about fees, tuition, withdrawal from a course, copyright issues, and plagiarism. Web clients often assume that because the teaching/learning environment is different, that policies are different as well. While maintaining such a page is no small chore, supplying and finding accurate answers before the fact is vital to good public relations.

Unique Needs of Web Faculty, Students, and Administration for Distance Education Support

Unique needs are no less real or less important than shared or crossover needs. These are, however, more difficult to anticipate, so this becomes the creative part of planning for support. For example, Sherry, Billig, Tavaline, and Gibson (2000), maintain that faculty who will be web teachers need to have time for training as well as "demonstrations of promising practices and ongoing professional development by peers" (p. 45). The unique needs of faculty, therefore, include the planning and design of the course, the faculty member's existing values, and the time available to develop the course. Support strategies that address these needs include the following:

Small: Continue discussion about technology integration that encourages a KISAC (Keep It Simple and Creative!) approach. Mounting a faculty help page with frequently asked questions on the web shares information among instructors and provides faculty support that may be accessed multiple times without intimidation or embarrassment.

Medium: Provide in-depth workshops about web pedagogy and the software that supports it, in a number of time slots, to meet a variety of faculty teaching schedules. Faculty members must make connections between web course content and web course goals/expectations with specific directions and published criteria for assessment. In addition, faculty members must know the strengths and limitations of the software they are using so that they can plan interactive activities and assessments that will work.

Large: Offer "hands-on" workshops about page design and image manipulation. With course plans in place, faculty members require support in making their web courses interesting and their classes learning communities. Uploading visual materials that conform to web standards, internal linking to other sites, and creating quizzes/tests online are more sophisticated tasks and need lab time and direction.

White & Weight (2000) assert that "effective online teaching is twofold: the ability to transmit messages clearly and accurately and the ability to maintain positive interpersonal relationships" (p. 10). If faculty members are to be effective teachers, then, they must have the support to develop the knowledge and confidence to show enthusiasm both for their content and distance education.

The fact that the World Wide Web makes it easier to deliver up-to-date teaching material on a global basis is irrelevant if students find the medium difficult to use, or if they are not appropriately supported in their attempts to learn with it (Mason and Kaye, 1990). Students also need information about time and work management of online learning: Does the potential student like to read and write? More than one student has found that electronic communication means a level of typing that he/she had not envisioned.

Students also need assistance to help them use electronically accessed data and process concerns and complaints. Students want convenience, and they want "a curriculum that integrates theory with practice while emphasizing workplace competencies along with teamwork and communication skills" (Klor de Alva, 2000, p37). To accomplish these goals the following strategies need to be in place:

Small: Provide clear information about the dates the class will be held, how to obtain course materials and textbooks, and a hyperlink to an online student guide for the software.

Medium: Post technical support for students on the web through an e-mail contact page. Other types of assistance would include specific help pages about submitting assignments, accessing grades, and participating in multi-level discussions.

Large: Provide immediate technical help with an 800 number or periodic help through office hours in a real-time chat room. Whatever the media, questions directed to support personnel must be answered accurately and quickly. Establishing an electronic peer mentor network in a web-based environment also allows students to interact online with peers who have taken web courses previously so they might seek academic and technical advice.

As higher-education institutions establish web-based courses and programs, the typical college or university experiences "problematic goals, unclear technology, fluid participation in decision making" (Ehrmann, 2000). Resources of money, time, faculty and staff may need to be reallocated to achieve a web program with high standards and goals. To achieve these goals, the following support strategies must be addressed:

Small: Provide information about student profiles and usage patterns so that administration can make consistent purchases of hardware and software to support a web-based academic program.

Medium: Inform the administration about updates and upgrades of web software as well as minimum standards in hardware/software for successful online teaching/learning. This data is absolutely essential for instituting a consistent plan for keeping both hardware and software current.

Large: Create and distribute an online evaluation of web course experiences to students. Support staff then needs to collect and analyze the data as will as publish results so that decisions about web courses and programs might be data-driven.

Assessment of the Support Design

Any design process needs assessment to test its strength in implementation and provide information for refinement or restructuring. This design is informed by data from student evaluations of web-based courses for the summer of 2000. When asked about their experience with web-based courses, 76% (N=268) of the respondents reported that they had not taken a web course previously. This large number of novice users obviously impacted the amount of support needed.

Of those that responded to specific questions about technical support, 68.4%(N=79) found the technical support pages helpful. When the technical support staff was contacted, over 77%(N=66) found the staff helpful. This contact was most often made through e-mail by 53.5% of the respondents (N=71). Initial contact about Web courses by phone or through the summer 2000 website was favorable in most cases (89.5%) (N=57). Of those that responded, over 91% (N=59) found the information they received from these initial contacts helpful and thought it met their needs. Overall, 61.1% (N=90) respondents registered a satisfied or very satisfied level for the technical support they received.

Future Directions

Teaching and learning through distance education on the Internet currently involves radical changes in our traditional paradigms of academic thinking and acting. Yet online teaching and learning will continue to change as software and hardware evolve to allow easy voice and visual streaming for video conferencing. The following areas will undoubtedly affect online teaching and learning and lead distance education support in new directions:

- Bandwidth and speed of data transfer - The segment of the Internet that brings course material into a student's home or the faculty member's office will continue to increase in capacity and speed.
- Availability of hardware and user-friendly software - The dot-com culture of virtual e-commerce and education is influencing the price of web-based hardware and software, bringing it to a level that is affordable by the average user.
- Synchronous learning systems - The ability to log on and to interact in real time with an instructor and/or other students will moderate the amount of text currently required.
- Consumer demand - students are turning to distance education for convenient anytime, anyplace educational experiences.
- Economic factors - Students may be able to avoid travel, and/or on-campus residency, thus reducing educational expenditures. In addition, students can continue to work as they learn because they are not governed by a university class schedule.

•Sophistication of web faculty - As higher education personnel become familiar with new software, and digital peripheral equipment, they will need more server space, speed, and support maintaining advanced techniques.

A successful design for distance education support does indeed involve different levels, numerous strategies, and its own measure of resources. Without a strong support system for all stakeholders in the online learning process, however, virtual classrooms could be individually spinning in cyberspace, lacking the anchor that solid technology policies and training can provide.

References

Chang, V. (1998). Policy development for distance education. In *ERIC Digest.* [On-line]. Available: http://www.ed.gov/databses/ERIC_Digests/ed423922.html.

Chickering, A. W., & Dhrmann, S. (2000). Implementing the seven principles: Technology as lever. In *American Association for Higher Education Bulletin.* [On-line]. Available: www.aahe.org/technology/ehrmann.htm.

Ehrmann, S.C. (1991). Gauging the educational value of a college's investments in technology. *Educom Review*, 26(30-4), 24-28.

Hatcher, T. & Craig, B. (1998). *Humanizing the technological learning experience. The role of support services as socialization in a human resource development distance education program.* (ERIC ED Publication No. 415-407).

Hsu, S., Marques, O., Hamza, M. K., & Bassem, A. (1999). How to design a virtual classroom: 10 easy steps to follow. *T.H.E. Journal, 27*(2), 96-109.

Klor de Alva, J. (2000). Remaking the academy. *Educause Review*, March/April, 32-40.

Mason, R. D., and Kaye, A. (1990). Towards a new paradigm for distance education. In Harasim, L. M. (ed.), *Online Education: Perspectives on a New Environment.* New York: Praeger.

Sherry, L, Billig, S., Travaline, F., & Gibson, D. (2000). New insights on technology adoption in schools. *T.H.E. Journal 27*(7), 43-46.

White, K. W., & Weight, B. H. (2000). *The online teaching guide.* Boston: Allyn and Bacon.

Academic Staff Development Course for Coordinators of Distance Education. Russian Experience

Dr. Marina V. Moisseeva,
Senior Research Scientist, Distance Education Laboratory, Russian Academy of Education (Moscow, Russia);
Fulbright Scholar 2000-2001 at Stanford Learning Lab, Stanford University (CA, USA)
mois@stanford.edu

Dr. Victor A. Krivoschokov
Head of the WAN Department, South-Urals State University (Chelyabinsk, Russia)
victor@urc.ac.ru

Abstract: Rapid development of the Internet-based distance courses at Russian universities brought out the problem of special in-service training of faculty members. The training should provide future coordinators of distance courses with information about the online educational environment, active methods of teaching (project-based methods, collaborative learning, cooperative learning, etc.), as well as develop their communication skills that could be considered to be the main skills for the teacher working with students on the net in conditions of the distributed teamwork. Within the course learners identify their personal skills and abilities that can influence their work on the net, and develop their own educational trajectories for self-education after graduating from the course. Learners go through various online psychological tests and participate in a series of online exercises and role-plays. The paper gives the overview of the Internet-based training course for coordinators, methodological basis, structure of the course, and first results of its implementation.

Introduction

Today the society states the problem to provide each man with the free open access to education within his life subject to his interests, personal abilities and needs. The other problem is to prepare a man for a life in conditions of rapid change of information flows, for the possible change of profession, for the active independent life, for the communication with people from different societies and cultures, for the quick adaptation in the newly conditions. The urgent necessity of organization of mass in-service training of specialists in today's Russia influenced the increasing development of such form of education as distance education.

We understand distance education as a specific form of education, which formally is used when a teacher and a student are divided by miles, being in fact connected by the New Information Technologies including the wide variety of modern means of communication.

Distance education is very popular in Russia now. According to the latest data that was published in the recent sociological surveys, more than 26% of freshmen at Russian Universities and colleges are ready to study on the Internet. 50% of them want to take the distance learning courses at the leading Moscow universities, and 24% are going to attend the foreign virtual universities. 30% of families in Moscow and St. Petersburg have personal computers at home, and half of them use the Internet.

Considering all above-mentioned the most of the Russian universities have recently opened the distance education faculties and departments. The "National Program of Distance Education Development" is in action since 1995. In accordance with the Program Execution Plan, universities were equipped by the modern computer classes. Many universities organized Internet Open Access Centers for the students. There were also developed hundreds of various Internet-based training courses. But the results of the program could be better because it came across several problems, such as the following:

- most of the distance courses are in practice just the ordinary repetition of traditional correspondence courses with elements of the self-education (no permanent contacts between students and teaches, obligatory internal "face-to-face" meetings at exam sessions, etc.);

- there are no well-trained specialists among the faculty members to provide distance courses (i.e. coordinators who understand what distance education is, what are the effective methods of teaching via Internet, what are the basic rules of E-courses development and management, etc);
- it is very difficult to integrate the existing Russian system of distance education into the world-wide system because there is a lack of specialists who can professionally do it.

So there is an obvious contradiction between the urgent need in accelerated development of Russian system of distance education and the lack of specialists to develop it. At present no Russian academic institution is being busy with the complex training of specialists for distance education in such important subjects as:

- active methods of teaching (cooperative learning, project-based methods, etc.);
- psychology of communication via Internet;
- organization, management, and evaluation of distance courses.

General Idea of the Course

Answering the demands of the academic staff involved in a process of distance education in 2000 a group of scientists from the Russian Academy of Education (Moscow, Russia) and Southern Urals State University (Chelyabinsk, Russia) developed the pilot project – Internet-based course for coordinators of distance education http://courses.urc.ac.ru.

What is the coordinator of distance education?

The word *"coordinator"* is used here as the most general word explaining the role of the "key-persons" in a process of the distance learning and teaching – facilitators, moderators, tutors, coaches, etc. The coordinator influences the educational process at a great extand being responsible for:

- *Facilitating* the course discussions and forums;
- Supporting the group project activities as a *coach*;
- Supporting individuals as a *tutor*;
- Evaluating the assignments;
- Planning and monitoring the course activities;
- *Moderating* the conflicts, and etc.

Being the coordinator of the distance courses means to be:

- competent in the subject area;
- advanced Internet-user,
- skilled communicator;
- efficient in psychological aspects of teaching and learning on the Internet;
- ready to use active methods of teaching related to Internet.

Aims and Objectives of the Course

The main aim of the course was to provide Internet-based training for academic staff and secondary school teachers and prepare them for the work as coordinators of distance courses. The objectives of the course included the following:

- Give the idea of the distance education;
- Train in the field of new methods of active teaching and learning;
- Develop communication skills;
- Identify personal skills and abilities of learners that can influence their work as coordinators within distance learning courses.

Characteristics of the "Pilot Team"

People

Distributed "pilot team" included learners, authors of the course, coordinator, administrator of the course, system administrator, and professional psychologists. Learners were volunteers from the various educational institutions: teachers of secondary schools, faculty members from two universities, instructors from regional departments of teachers' training institutes, and coordinators of educational telecommunication projects.

Equipment

The equipment that learners used was typical for average Russian learner and included IBM-compatible personal computers with Windows 98, or NT, and MS Office 2000 unit (MS Internet Explorer, Outlook Express, Word, FrontPage). The learners had access to the Internet either from home (dial-up access by 28.8 Kbps modems), or from the University Internet Center (direct access, 64 Mbps channels).

Access to the learning tools was possible via Internet, or from home computers (downloaded zipped files with texts, tests, and instructions).

Content and structure of the Course

Within three months of training via Internet the students were involved in a process of active E-learning. They studied the Web-textbook, developed for the purposes of the course. This textbook was enriched by a collection of the links to other Internet-based educational resources and online editions.

The content of the course materials depended upon the main objectives of the course. It included such modules as:

- Introduction into the system of distance education;
- Internet-based technologies and educational environment, used at distance learning;
- Communication via Internet: basic rules and problems;
- New methods of teaching and distance education technologies;
- Psychological aspects of working with students in the Internet environment;
- Monitoring and evaluation of the distance education courses.

Learning Process

Learning process within the course was organized by the three months curriculum, series of control assignments, clearly outlined aims and objectives for each unit, and by ongoing feedback.

Learning tools

Learners had the access to various "learning tools" and "information tools", among those were the following:

- Educational courseware kit, that included: a textbook "Internet Guide (for Educators)" with information about Internet main services, software that would be used within the course, search engines, and numerous examples of the educational resources on the Net;
- Web-textbook;
- Sets of control assignments with detailed description of the task, references to the sources of information, general guidelines on preparing the reports and examples;
- Supplementary materials for individual research projects (on-line tests, questionnaires, etc);
- Collection of the links to the Internet educational resources;
- References on the traditional tools – books, articles, etc.

Modular Structure

The course had a modular structure. Each unit included several activities (steps) that the learners should pass through.

1. Outlining the learning objectives;
2. Readings & "seeings";
3. Experimenting, testing, self-evaluation and inter-evaluation;
4. Doing individual or/and group assignments;
5. Reflecting, discussing, receiving the feedback;
6. Outlining the new learning objectives and problems.

Interactions within the Course

Learners were involved into numerous interactions with the coordinator and other students of the virtual group. The majority of assignments for students were based on active methods of teaching: Internet projects, cooperative learning, science research methods and etc. that motivated learners to work in collaboration with other students of the group, create the permanent "peer-to-peer" connection, and step by step become acquainted with all members of the group as well as the coordinator. They learned how to think globally, to argue and to find compromise within discussion. They developed the critical thinking and abilities to take their own decisions in everyday situations related to distance learning. This process appeared to be rather difficult for many learners that had problems in establishing communication process with other people on the Net. But the series of specially designed online role-plays and individual advises of the coordinator helped them to solve this problem and to develop necessary communication skills.

All interactions among members of the group were organized by:

- e-mail;
- mailing lists (one for learners and coordinator, and the other - for coordinator and supporting team);
- chat-rooms ("Classroom" for formal discussions with protocol recording and "Break" for informal meetings).

Forms of Learning

Different assessments that learners did within the course demanded the use of different forms of learning:

- Individually,
- In pairs,
- In small groups (3-4 learners);
- In larger groups (10-12 learners);
- All the group.

The larger groups were effective within psychological online role-playing and chat sessions. Smaller groups were effective at doing projects, problem solving, and refection. Work in pairs was the best form for inter-evaluation of the existing characteristics of the learners, as well as for the reflection and discussions of the results of the tests within "peer-to-peer" experiments.

Tests

One of the course objectives was to provide learners with the effective tools for self-evaluation that could be used for the development of the personal self-education trajectories of the future coordinators of the distance courses. We came across the problem of unsuitability of famous "classical" psychological tests that could be used to identify motivation, leadership, communication type, and other features of character of the learners, if to place them on the Net directly. It was impossible to transform them in a form of the interactive tests either because of the huge amount of questions that learners should read and answer online, or the evaluation of this answers couldn't be done automatically, by computer program. We developed the list of criteria to select the psychological tests available for online self-evaluation and analysis: no more than 30 questions, no open questions, quick automatic response (feedback), etc.

The Supporting Group of Psychologists

Characteristics of the Internet learning Environment

Developing the conception of this course we realized that the majority of the existing problems of the adults' adaptation to the new learning environment of the Internet are caused by the following reasons (in comparison to traditional "face-to-face" learning experience):

- Domination of the new sensor channel (visual);
- Adult learners working together at a distance course have different learning styles, experiences, characters;
- Some of the learners suffer from information stress and frustration within their first weeks of learning on the Net;
- Internet demands new rules for communication – "democratic Netiquette";
- Not all the adults like to have many new contacts and collaborate with strangers;
- Not all the learners are highly motivated;
- Not all learners are well-organized and could do the self-assessment tasks.

All these questions are the top-interest questions for the researchers working not only in the field of education, but psychology as well. Professional psychologists could contribute the development of some distance courses helping educators to avoid the "reinvention of the wheel". Psychologists could share their methods of evaluation of individual characteristics of the learners, methods of evaluation of the group dynamic processes which are very important for proper evaluation of the effectiveness of the distance learning, and appropriate choose of forms and methods of learning. Practical psychology in Russia and in other countries served for many years in the field of business education, developing the strategies and methods of various in-service trainings in communication, collaboration, team-work, etc. We decided to unite together the efforts of professional psychologists and methodologists, developing and monitoring the effectiveness of the distance course together.

The learners were supported by a group of psychologists who consulted students at their request, and monitored the psychological climate within a group of students. Working together with coordinator of the course, psychologists help students to build their self-development program ("educational trajectory") that would guide them after completing the course.

Objectives of the Online Psychological Service

So, the main aims and objectives of the "psychological service" within the course were outlined as the following:
Aims:

- Creation of the friendly psychological environment;
- Learners support in development of the individual educational trajectory.

Objectives:

- Evaluation of the Course educational environment;
- Study of the personal features of the learners;
- Help in adaptation to the new online environment;
- Popularization of the relevant to the course content psychological issues and theories.

The supporting team of psychologists worked within all stages of the course providing:

- Analytical work and group dynamic's monitoring;
- Instructive support (advices on the We-site design, structuring of the course context, developing of the ongoing system of the feedback, etc.);
- Consultations (individual and group consultations for students, for coordinator, and developers of the course learning materials);
- Methodological support (participated in development of the online tests for self-evaluation and inter-evaluation, etc).

Development of the Learners Online Community

Though the learners were from different educational institutions their group had all "core" attributes of the network community (Whittaker, Issacs, & O'Day, 1997):

- shared goals, interests, needs, and activities;
- engage in repeated, active participation in the course assignments, chats, etc.;
- access to shared course resourses;
- shared social experience, language, netiquette;
- shared support, help, and mutual services.

At the same time (and it's a paradox of the teachers' profession) educators usually suffer from loneliness, they frequently loose the fluency in establishing communication with other adults, are not active, and pretend to be lurkers instead of leaders in a team of the adults (J. Preece, 2000).

Taking into consideration these specific characteristics of the learners and objectives of the course much attention was paid to the development of the system of learners' adaptation to the new communication environment that included:

- Theoretical material to explain the learners the basic rules of Internet environment;
- Online exercises on establishing trust-building and collaboration among peers of the group;
- Psychological role-plays and online tests for self-assessment and self-awareness;
- Project-based assignments.

Much attention was paid to creation of a friendly psychological environment. The objectives for doing this were the following:

- To develop the learners community;
- To help teachers to get acquainted with each other;
- To develop collaboration skills;
- To provide trust-building process;
- To support the on-going interactions among all the members of the group.

The initial educational background and experience of the learners at the course was different. That is why we developed two levels of the specially designed online exercises:
First – for identification of the current status (level) of a learner. At this level exercises are combined with various tests for self-assessment and inter-evaluation as well as group and individual experiments followed by reflection and group discussions of the results.
The second level of the exercises includes exercises which main objective is to put the learner into the new learning conditions and let him use his knowledge in real collaboration with real people on the Net.

Conclusion

The Russian language version of the course was launched in March 2000, and two groups of learners (16 learners in each) from Moscow, Ufa, Novgorod, Chelyabinsk, Irkutsk, and other cities of Russia participated in it. Main achievements of the pilot training:

- Adaptation of new pedagogical technologies and active methods of teaching at online distance courses;
- Effective combination of individual and group activities;
- Permanent contacts and feedback among learners via Internet;
- Development of the system of online exercises and tests for pedagogical and psychological self-assessment and development of necessary skills for communication and collaboration within Internet environment;
- Development of the "Conception of the Psychological Service at Distance Learning"

Acknowledgements: This course was initiated and supported by the Project Harmony, Inc. within the Bureau of Educational and Cultural Affairs' IATP Program activities in Russia (http://iatp.projectharmony.ru), and then developed and enriched with new content and system of online exercises at Stanford Learning Lab (Stanford University, USA) under the Fulbright Scholar Program (http://learninglab.stanford.edu).

Distance Learning: Effective Strategies for the Information Highway

Sara Olin Zimmerman, Ph.D.
Department of Curriculum and Instruction
Appalachian State University
United States
Zimmermnsj@appstate.edu

Melanie W. Greene, Ed.D.
Department of Curriculum and Instruction
Appalachian State University
United States
Greenemw@appstate.edu

John Tashner, Ed.D.
Department of Leadership and Educational Studies
Appalachian State University
United States
Tashnerjh@appstate.edu

Abstract: This study was created to fill a void in the knowledge of instructor behaviors, effective instructional strategies, assessment measures and the overall effectiveness of learning in the distance education classroom from the student's perspective. Specifically, this study had graduate students evaluate three professors in three different courses during a fifteen-week semester while teaching in synchronous learning environments. Two of the instructors conducted classes at two sites simultaneously and the third conducted a three site class. At the end of the fifteen weeks, students in all classes were surveyed. All classes were comprised of graduate students who were practitioners in various fields of education. The most used strategies were lecture, group discussion, and cooperative learning. The most effective strategy was noted by students as cooperative learning, followed by group investigation, and presentation. On the open-ended questions, students concurred that a plethora of teaching strategies was employed to engage learners.

Introduction

With an extensive review of the literature and a clear understanding of purported limitations in past research, this study was created to fill a void in the knowledge of instructor behaviors, effective instructional strategies, assessment measures, and the overall effectiveness of learning in the distance education classroom from the student's perspective. Specifically, this study had graduate students evaluate three professors in three different courses during a fifteen-week semester while teaching in synchronous learning environments. Two of the instructors conducted classes at two sites simultaneously and the third conducted a three site class. At the end of the fifteen weeks, students in each class were surveyed. All classes were comprised of graduate students who were practitioners in various fields of education. It was hoped that because of their expertise in education, this pool of students would give insight into appropriate and inappropriate uses of various teaching strategies and techniques.

Theoretical Framework

Distance learning has become a reality in an era when universities are searching for ways to increase student populations and to better serve the needs of their existing students (Charp, 1999). This learning environment encompasses a combination of technologies, including television, videotapes, audiotapes, video-conferencing, email, telephone, fax, Internet, software and print (Merisotis, 1999). It has been speculated that this new form of learning will become a commonplace phenomenon in the next century and has the potential to create a new vision in education (Ben-Jacob, Levin, & Ben-Jacob, 2000). Some have even predicted a new role for teachers; one in which they will act more as social workers or guidance counselors to provide personal one-on-one tutoring and to teach collaboration and interpersonal relationship skills (Schank, 2000).

Should we, as educators, question these technologies and their use in education? Universities continue to add new technologies as they become available. Are we allowing technology to determine the learning experience? And, on a more individual level, what is the significance of teaching strategies in this environment? The future may hold a different role for the teacher, but for now, effective instructional strategies are a large part of effective instruction. Do these change in the distance education classroom?

The literature on distance learning includes numerous studies such as: student perceptions comparing online to traditional lecture class quality (Ryan, 2000), the achievement of students in distance learning and traditional classrooms (Schulman & Sims, 1999; Dominguez & Ridley, 1999), demographics of students taking online courses (Guernsey, 1998), staff training needs (Connell, 1998), support for faculty teaching (Bremner, 1998), and community and team formation in distance education classrooms (Berg, 1999). There is a more limited body of research on the effectiveness of specific strategies using the distance learning platform. Some of these studies discuss the shifts in social relationships (Newson, 1999) and accommodating diverse learning styles (Ross & Schulz, 1999; Diaz & Cartnal, 1999). A few studies suggest the use of specific instructional strategies such as online student portfolios, self-guided online labs, class cybersociety, effective graphics, organized readiness, and the need to adapt instructional materials (Goodman, 1999; Powers, 1999; Grubb & Hines, 1999).

Methods/Results

In this study, two classes consisting primarily of elementary and middle grades' majors were enrolled in core graduate education courses. The first, *Connecting Learners and Subject Matter*, is a course that connects the examination of curriculum foundations and models of the school learner and educational goals with an intense study of research-based, exemplary instructional strategies focused on learning and achievement, and the second course, *Teacher Leadership and School Improvement*, was designed to help teachers develop an understanding of and skill in assuming leadership roles and responsibilities in their schools. In the *Connecting Learners* course, three separate sites were joined with the North Carolina Information Highway. One group of students met in the technology equipped classroom at the university and two groups were approximately 75 miles away at secondary school media centers. Each site had one technician to facilitate the use of cameras and media during instruction. A web site was designed to assist the students with daily assignments and resources. In the event there were delays due to faulty connections, students at the remote sites worked independently using the daily assignments on the web-site to guide them in engaging in class activities. The instructor for this course had no previous experience with distance learning. The second course, *Teacher Leadership*, was taught in a similar manner to the first course except there were only two sites and a web site was not used. The instructor for this course had no previous distance learning experience. The third class was *Telecommunications Technology in Education*, usually the second in a series of educational technology courses that students take for a graduate degree for K-12 licensure in North Carolina. While the major emphasis is the development and use of telecommunications tools in instruction, basic considerations in setting up telecommunications connections, and issues in maintaining telecommunications facilities are discussed. This course was taught to two remote sites from the main campus. Each site had computers for each student and two adjuncts to rotate between the two sites to assist with instruction. A web-based supplement was also developed for the course that included course orientation, daily outline and assignments, resources, and a threaded discussion forum. The instructor for this course had previously taught via distance.

Item Response Survey

Fifty-six students in the three courses completed a survey about student demographics, a general evaluation of the instructor, an evaluation of twenty-one instructional strategies, and five open-ended questions about the effectiveness of the course. Fifty-two students were teaching in the public schools ranging in grades from kindergarten through high school. One student worked in the central office of a school system, one was in ROTC, and three were full time students. The students' number of years teaching in public schools ranged from 0 to 27 years, with an average of 9 years. Thirty-one of the students had previously taken courses via distance learning.

N=56	strongly agree	agree	disagree	strongly disagree
Actively involved students	47	9	0	0
Encouraged participation	49	7	0	0
Respected students' opinions	51	5	0	0
Stimulated critical thinking	47	9	0	0
Gave hands-on experiences	33	23	0	0
Consciously planned for the instruction events	39	17	0	0
Prepared lesson plans based on needs of learners	25	31	0	0
Encouraged the expression of differing viewpoints	50	6	0	0
Used active, interesting audio visual aids	29	25	2	0

Table 1: Evaluation of Instructors

The above table gives an overview of the responses when students were asked to respond to a list of nine instructor behaviors. Students, in each class, either agreed or strongly agreed that all three instructors encouraged participation, actively involved students, etc. Only two students disagreed that active, interesting audio visual aids were used. The results from this portion of the survey suggest that all three instructors were effective in the classrooms engaging students in meaningful collaborative activities.

Instructional Strategy	Use in Class				Effectiveness
N=56	no response	not at all	some of the time	most of the time	strongly agree to strongly disagree (5 to 1)
Cooperative Learning	0	1	24	31	4.49
Group Investigation	0	3	17	36	4.48
Presentation	3	1	28	24	4.48
Reflective Thought	1	0	28	27	4.43
Group Discussion	0	0	39	17	4.40
Question/Answer	0	3	17	36	4.31
Lecture	0	7	20	39	4.22
Direct Instruction	2	4	9	40	4.18

Table 2: Report of Use and Effectiveness of Instructional Strategies

Twenty-one instructional strategies were listed next to a check sheet and a Likert scale in which students were asked to determine whether or not a strategy was used in class and to rate its effectiveness. The eight most effective instructional strategies are listed on Table 2. The most effective strategy was noted by students as cooperative learning, followed by group investigation, and presentation. The most used strategies were lecture, group discussion, and cooperative learning.

Open-ended Survey

BEST COPY AVAILABLE

On the open-ended portion of the survey, students were asked to briefly describe and comment on the effectiveness of: 1) Teaching strategies in this course, 2) Assessment in this course, 3) The use of technology in this course, 4) Did the professor's on-site visit(s) impact your class? If yes, how?, and 5)Additional comments. They concurred that a plethora of teaching strategies was employed to engage the learners. Though lecture was used, it was not cited as a dominant approach. Cooperative group activities were used predominantly in each class. Discussions occurred frequently at intra and inter site level following presentations made by the cooperative group activities and individual presentations. Students cited the use of videos, power point presentations, and projects as effective. One student commented that when the class size and number of sites increased, the amount of time required to share research also increased. The suggestion was made to have individual sites hear presentations from their colleagues and "turn off the camera". However, it was noted that the downside of this approach is that sites would not benefit from their peers' research. This comment came from a participant in the section where three sites were linked for instruction.

The use of assessments and reactions varied with these participants. In one section, no traditional tests were used. However, students created culminating projects to demonstrate mastery of course objectives. Though traditional quizzes or tests were used, the emphasis on critical thinking, project-based assignments, and group work made it necessary to incorporate a wider variety of assessments. Attendance and class participation were cited as a component of the final grade in each course syllabus. In one section rubrics were used to evaluate student presentations and written projects. One responder noted that rubrics "were very fair" and provided a medium for giving "informative feedback instead of just putting a grade on our work." Such comments as "fair and reasonable," "prompt and beneficial," "appropriate," and "effective" were included. One student noted that the assessments used were "typical of other graduate classes."

The use of technicians on site was cited as an effective means of ensuring quality delivery of the course. "On several occasions, technology presented a problem because of delays in connections," audio problems and CyberClassroom receptions. Students also commented on their use of technology in individual and cooperative group presentations citing numerous presentation, communication, and website development software. E-mail and websites were used to communicate intermittently throughout the semester. Technology was cited as "a must. Without technology there would be no DE." Students' comments clarified that the technology was critical to the effective delivery of the course and also concluded that video and audio problems "were not the instructor's fault."

For each of the three groups who participated in this study, the professor delivered the instruction from the university setting. In two of the sections, students were also enrolled at the university site. Although professors agreed to deliver the course from the university setting, one to four on-site visits were scheduled throughout the semester. When polled to this regard, students were extremely positive about the opportunity for face-to face interactions. Comments were made such as: "It gave me a sense of connectedness I would never have had," "Having the professor there made it more personable," "I enjoyed her visits," "A warm body makes a big difference in attention span," "It provides a personal touch," "I felt more comfortable voicing concerns or issues that I needed to have taken care of," "The professor's visits provided the needed eye-to-eye contact," and "It made us feel more comfortable, but I'm not sure it impacted the learning." Students at the university site unanimously expressed an advantage over the distanced students because of the interpersonal relationships that developed before and after class with the instructor.

Students entered a variety of responses in the category of additional comments ranging from personal comments about the process of distance learning to specific assignments to the value of this university program. One student doubted the value of distance learning initially and concluded that the unique variety of teaching strategies changed his mind about its utility. Another decided not to enroll in another DE course stating "technology is not always the answer." Several of the students concluded that without the distance learning option, they "would have never gotten a Masters Degree." One student commented, "This class would have been worth the tuition even if I weren't pursuing a degree. I learned a lot and I changed my mind about a lot of things I was doing (in a secondary math classroom). Thanks for doing what a teacher is supposed to do."

Educational Importance

Distance learning offers opportunities for students to obtain new skills and achieve graduate degrees from our universities. As professors, we are charged with the task of delivering course content without compromising its rigor. Thus, the strategies employed in these satellite programs must be examined from the perspective of the learner and the instructor. Teaching and guiding learning is no easy task in the most favorable of conditions, notwithstanding one that may not be optimal as an educational environment. Instructors must be given specific guidance based in research. The stakes are too high for teachers to read manuals on distance learning based on practices lacking a theoretical framework. Thus, additional research is needed to investigate the effectiveness of specific instructional strategies.

References

Ben-Jacob, M.G., Levin, D.S., & Ben-Jacob, T.K. (2000). The learning environment of the 21^{st} century, *Educational Technology Review*, 13.

Berg, G.A. (1999). Community in distance learning through virtual teams, *Educational Technology Review*, 12, 23-29.

Bremner, F. (1998). On-line college classes get high marks among students, *USA Today, November 16*.

Charp, S. (2000). The millennial classroom, *T.H.E. Journal*, 27(6), 6.

Connell, G. (1997). Distance holds the key to growth, *Times Higher Education Supplement*, 12.

Diaz, D.P. & Cartnal, R.B. (1999). Students' learning styles in two classes, *College Teaching*, 47(4),130-135.

Dominguez, P.S. & Ridley, D. (1999). Reassessing the assessment of distance education courses, *T.H.E. Journal*, 27(2),70-76.

Goodman, D. (1999). Validating factors that impact on the success of distance learning initiatives, (ERIC Document Reproduction Service No. 429595).

Grubb, A. & Hines, P. (1999). Innovative on-line instructional strategies: Faculty members as distance learners, (ERIC Document Reproduction Service No. 430455).

Guernsey, L. (1998). Distance education for the not-so-distance. *The Chronicle of Higher Education*, 44(29), 29-30.

Merisotis, J.P. (1999). The "what's-the-difference?" debate, *Academe*, 85 (5), 47-51.

Newson, J. (1999). Techno-pedagogy and disappearing context, *Academe*, 85 (5), 52-55.

Powers, K. (1999). A self-fulfilling prophecy: Online distance learning for introductory computing. (ERIC Document Reproduction Service No. 432994).

Ross, J.L. & Schulz, R. A. (1999). Using the world wide web to accommodate diverse learning styles, *College Teaching*, 47(4), 123-129.

Ryan, R.C. (2000). Student assessment comparisons of lecture and online construction equipment and methods classes, *T.H.E. Journal*, 27(6), 78-84.

Shanck, R.C. (2000). A vision of education for the 21^{st} century, *T.H.E. Journal*, 27(6), 42-55.

Schulman, A.H. and Sims, R.L. (1999). Learning in an online format versus an in-class format: An experimental study, *T.H.E. Journal*, 26(11).

Teacher and Developer: A Compromise for the Creation of CSCL Applications

César Osuna[1], Yannis Dimitriadis[2], Alejandra Martinez[2], Rocio Anguita[2]
[1] Universidad Autónoma de Guadalajara, Mexico.
cosuna@cu.gdl.uag.mx
[2] Universidad de Valladolid, Spain.
yannis@tel.uva.es, amartine@infor.uva.es, rocioan@doe.uva.es

Abstract. In this paper we present a methodology that reduces the level of complexity when analyzing, designing and evaluating technology-based collaborative learning applications. Its main characteristics are the agreement or compromise reached by teachers and developers in the creation of those applications and the interaction between both roles. The above-mentioned methodology is based on iterative and participative analysis, progressive design and collaborative evaluation. The analysis is performed by means of the presentation of a series of five templates that comprise and model the domain of a collaborative learning situation and Design is supported by a class model. The validation process is attained through usability-based techniques. The methodology is part of the DELFOS project (A Description of tele-Educational Layer Framework Oriented to Learning Situations).

Introduction

The development process of CSCL (Computer Supported Collaborative Learning) (Koschmann, 1996) applications is a complex task, because several factors play an active part, namely: educational process and classroom aspects and those related to the appropriate use of computer network technology. Hence, the aforementioned applications have to be jointly developed by both the teacher and the developer. The teacher-developer relationship triggers a series of mutual understanding problems derived from their communication difficulty; this difficulty is due to the mismatching between the pedagogical and technological vocabulary used by each of them. Besides, the teacher is not familiar with technology; nor is the developer aware of the needs of the classroom.

The search for a possible solution has gone through different Software Engineering strategies in which the teacher is interviewed by the developer on several occasion. Unfortunately, this sort of activity has not allowed the developer to grasp the adequate and precise requirements derived from the classroom needs. A different strategy has been the creation of authoring tools which should be used by the teacher to build his/her own technological developments. The resulting applications present poor robustness. By means of the third strategy teachers have been provided with generic telematic frameworks so that they are able to develop the collaborative application. The applications produced focus on solving communication problems, but do not establish tight links with the collaborative learning process. Therefore, these strategies have produced weak applications regarding the classroom problems and they have, once more, triggered the teacher's uncertainty about the effective use of technology in the classroom. Our strategy is based on the use of a conceptual and technological framework called DELFOS (Osuna, 2000). It proposes an iterative and progressive technique for the analysis and design of systems based on Usability (Mayhew, 1999) and on the use of transdisciplinary techniques (Vilar, 1997); the aim is to stimulate commitment of teacher and developer. The document continues with the methodology description and some conclusions.

DELFOS methodology

DELFOS proposes a four-phase methodology (see Fig. 1). First of all, we can see the *collaborative analysis* phase, in which the teacher describes the scenario and discusses it with the developer. It is here that DELFOS provides a series of templates describing the attributes that constitute a learning situation. Those templates use pedagogical vocabulary and they cover five aspects: Learning Situation, Learning Activity, Roles, Objects and Interactions. The second phase, *collaborative design*, starts in the analysis phase resulting scenario to which a series of class diagrams (also provided by DELFOS) are applied in order to obtain an object-oriented design. Once again, there is an iterative and progressive process that will suppress any design bug. In this phase, both roles dialogue in order to get a joint vision of the design. In the next phase, the design is *implemented* and DELFOS proposes a three-layer structure. Each of the layers takes a different problem into account: the *situational layer* is related to the interface; the *constructivist layer* deals with problems such as scaffolding and social interactions which are related to the knowledge construction process; the *cooperative layer* is in charge of defining the technological requirements needed for interaction and collaboration.

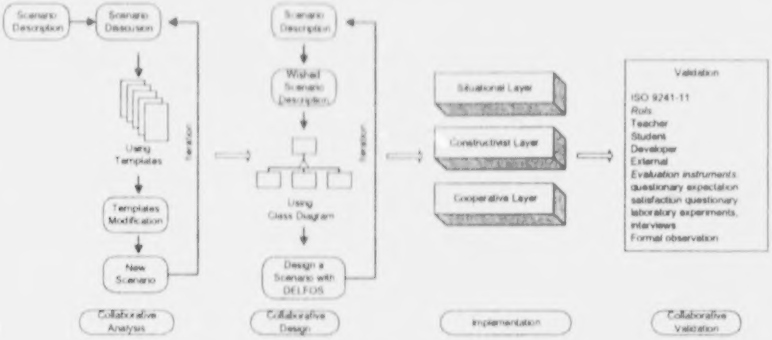

Scenario Description
Scenario Discussion
Using Templates
Templates Modification
New Scenario
Iteration
Collaborative Analysis
Scenario Description
Wished Scenario Description
Using Class Diagram
Design a Scenario with DELFOS
Iteration
Collaborative Design
Situational Layer
Constructivist Layer
Cooperative Layer
Implementation
Validation
ISO 9241-11
Rols
Teacher
Student
Developer
External
Evaluation instruments
questionary expectation
satisfaction questionary
laboratory experiments,
interviews
Formal observation
Collaborative Validation

Fig. 1 The DELFOS development methodology

Finally, the validation phase is presented by means of a collaborative evaluation of the resulting application. The roles that participate here are the Teacher, the Developer, the Student and External Evaluators. For this purpose DELFOS has in-built evaluation instruments based on usability principles and on ISO 9241-11. This methodology has been used in the development of three collaborative learning applications; one of them focuses on learning reading-writing skills, the other one on social abilities and the third one on language teaching abilities.

Conclusions

A framework like DELFOS diminishes the CSCL applications development complexity, because it serves as a communication means that reduces the vocabulary differences between the teacher and the technology developer . This allows that two roles work together in all the phases of the development process.

On the other hand, the templates proposed in DELFOS have made the application analysis task easier, since they provide the teacher with a reference framework for the observation of the general properties of collaborative applications. Similarly, having a series of predefined classes accelerates the application design process. The implementation has been possible through the use of Java language, though the use of other type of technology is not discarded. The validation process proposed in DELFOS has enabled us to evaluate not only the applications derived from the framework, but also the framework itself and the performance of each of the roles that take part in the development. DELFOS currently aims at getting a methodology that enables the analysis of the interactions carried out by means of the applications and establishes predetermined relations among the interactions.

References

Koschmann, T. (1996). *CSCL: Theory and Practice of an Emerging Paradigm.* Mahwah, NJ: Lawrence Erlbaum Inc.

Osuna, C. (2000) *DELFOS: A Telematic and Educational Framework based on Layer oriented to Learning Situations.* PhD Dissertation. Valladolid, Spain: Universidad de Valladolid.

Mayhew, D. (1999). *The Usability Engineering Lifecycle.* San Francisco, CA: Morgan Kaufmann Publishers.

Vilar, S. (1999). *The New Rationality.* Barcelona, Spain: Kairós.

BEST COPY AVAILABLE

Web-based Instruction: What should we know?

John Ronghua Ouyang
Bagwell College of Education
Kennesaw State University, USA
rouyang@kennesaw.edu

James E. Yao
Secondary & Higher Education & Media & Technology
Texas A&M University-Commerce, USA
shedey@etsuodt.tamu-commerce.edu

Abstract: Web-based instruction is the latest development of distance education, which has become an extremely important part of instructional technology. Web-based instruction has commonly adopted by universities and schools to deliver courses on line. Challenged by this advanced instructional technology, teachers will ask what we should know about it. The answer is that he or she should be knowledgeable of this advanced delivery method. He or she must be a life-long learner and be willing to face the challenge of being accountable for student's learning achievement. To obtain an effective web-based instruction, specific and clear instructional objectives are critical keys, strategic instructional time management and flexible collaborative learning environment lay down the foundation, and multiple means of evaluation guarantee the high quality of instruction and successful learning.

Web-based instruction is the latest development of distance education, which has become an extremely important part of instructional technology. The university system of Georgia has adopted WebCT as one of the instructional tools to deliver high education on line. Challenged by this advanced instructional technology, teachers are facing the question that what we should know about it. A critical issue is whether this web-based instructional approach can provide acceptable quality of instruction and whether students can receive expected opportunity of learning.

The development of web-based instruction

It does make sense that as society moves to a knowledge-based economy, increasing numbers of people will use communications technologies as a major tool for learning, no matter whether educators choose to encourage this process or not. It is believed that a deliberate transformation that maximizes the strengths and minimizes the weaknesses of the communication tools could greatly improve current educational practice (Elementk, 2000; Didsbury, 1982). The knowledge of the development of web-based instruction will help a teacher understand this advanced tool better and use it more effectively.

Web-based instruction is developed from traditional distance education that can be traced back to a century before (Tiene and Ingram, 2001). In the early 1800, because of reliable national mail service in the United State and Europe, instruction began to be delivered by mail. By the end of the century, a number of distance-learning schools were well established. The Chautauqua Institute in New York was providing adult correspondence education across the nation. The International Correspondence Schools of Pennsylvania combined mail delivery and face-to-face instruction by railroad cars to offer training in a variety of job skills. University of Chicago established the first university "extension division" that offered courses by mail.

In the early of the twentieth century, radio broadcasting was adopted in distance education. Along with providing written study materials for students, the University of Wisconsin became a leader who experimented with educational radio broadcasting. During the years of 1920s and 1930s, a number of universities in the United States practiced with radio broadcasting for their distant students. However, the use of radio broadcasting was declined after the World War II in the United States, partly because of the arrival of television.

Television became widely available in the 1950s. It was considered as a revolutionary development in the field of education, particularly in distance education. The Ford Foundation spent millions of dollars on its "master teacher" project. Lessons were taught by "master teachers" and delivered through television sets in multiple schools. Other teachers remained in their classroom to follow up the television lectures and work directly with their students. It was notable with the project conducted in Hagerstown, Maryland where schools television seemly promoted the education level of that rural school district. However, the conflict interests between master teachers and regular teachers made it nearly impossible for the implementation.

In the 1970s, the British Open University was established and it soon became a model of distance education around the world. The Open University used multiple media to deliver its courses, including mail, radio broadcasting, television programs, audio tapes, video tapes, and so on. Its well-developed curriculum, course materials, and multiple methods of course delivery made the university become successful. In the nineties, with advanced computer technology, the Open University began distributing lessons on computer discs, and has developed its own Web-based online courses.

The advance of computer technology opened an excellent manner of course delivery in distance education. Web-based instruction makes it an excellent education format for those distant students. Curriculum, course materials and class handouts can be posted on the Web. Instructors and students at a distance can chat in the chat rooms, discuss with a bulletin board, and complete projects on line. The increasing popularity of electronic mail and the World Wide Web make Web-based instruction even more possible. At present, many courses already exist on the Web. In fact, Walden University, Nova Southeastern University, The Union Institute and the University of Phoenix have entire degrees offered online.

A tool of Web-based instruction

Like Blackboard and Top class, WebCT (Web Course Tool) is one of the common tools for developing Web-based instruction. WebCT 3.0 provides more sophisticated features for teachers to develop on-line courses. It includes three major blocks: Course utilities, course components and course tools. Course utilities in WebCT are automatically encased in every WebCT course, allow teachers to transfer course files to the WecCT server, manage students' information, and control course layout. Course components are optional features that help teachers organize and structure courses, such as syllabus, course content modules, and course home page. Course tools are also optional features in WebCT. They allow teachers to present information, communicate with students, monitor and evaluate students' completion of the course, and assist students to facilitate learning.

With course utilities, teachers can create or modify courses with course setting management utilities, transfer course files with file management utilities, and maintain class roster and student grades with student management utilities. Course setting management includes identifying instructors, selecting language (at version 3.0, English, French, Dutch, Finnish and Spanish are available), creating course home page, designing course menu, setting course appearance. File management allows teachers zip and unzip, upload and download, link and group files for course instructional needs. After the files are uploaded, the files can be edited, copied, moved, renamed, and deleted. The files can also be regrouped and filed in exiting or newly created folders. Student management initiates lets teachers add students, import student data, list a subset of students, add or modify columns, and change settings and course access. It also let teachers tracking students' learning and managing students' presentation.

Course components can include course home page, syllabus, content modules, and resources links. On the course home page, teachers can have a welcome message describing the course and making the course accessible to the public. Within the syllabus, teachers can provide course description, objectives, textbooks, requirements, assignments, instructional outlines, and contact information, etc. Teachers can create or modify syllabus categories according to his or her instructional needs. Course content modules are structures of delivering. Teachers can present instructional materials, handouts, and test items. With content modules, teachers can also post discussion questions, assign learning activities, and organize the delivery of the course contents. External resources can be linked by URL. Teachers can introduce extensive on-line resources and connect them to the course. The external resources will help students enhance their learning.

WebCT 3.0 is equipped with a sophisticate course tool package. Within this package, there are page management tools, course content module related tools, communication tools and evaluation tools. Page management tools include tools for page organization, page creation, and URL links. Course contents related tools are those for course module creation, modification and organization. Communication tools consist of mail, discussion, chat plus whiteboard that allows teachers and students to share a drawing palette during an online discussion. Teachers and students can use whiteboard to insert text and graphics, choose fonts and colors, upload images from local computer and save images for future use. Evaluation tools are used to administer quizzes and surveys. Learning assignments, project presentations and students' grades can be monitored and tracked for evaluation.

Teachers, however, may experience some frustrations as they use WebCT. WebCT is not likely to deal with large group of files, like a set of PowerPoint presentations. Thoughtfully designed as it is, WebCT cannot handle the transfer of a group of files on the server at the same time. It is suggested that teachers have to zip those files first and then uploaded or downloaded zipped files. While linking sites or organizing the course topics, teachers can only deal with one site or one file at a time. When an attached file is transferred, the file can only be in html format, otherwise it won't be retrieved by the browser and opened with a mouse click. The attachment has to be downloaded for reading.

A practice of Web-based instruction

Web-based instruction helps distant students access to the courses they need, provides teachers with the new vehicle of instructional delivering to meet the individual learner's needs, and brings teachers and students, students and students together without time and space limitations. Students can access course materials at their local computers, practice skills according to the guidelines online and complete course assignments and projects collaboratively. The courses "Teaching mathematics in p-5 "and" Integrating technology in education" have been taught through WebCT for three semesters. Teaching mathematics in P-5 is taught with Web-based instruction as a supplementary practice. Integrating technology is delivered mainly through Web-based instruction. The former has the course materials hosted in presenter's personal Web site, and the later hosts the course materials on the WebCT server.

The course "teaching mathematics in P-5" is designed with 4 major components. They are course materials, course discussion, course resources, and course outcomes. The course materials are grouped into ten topics that are delivered together with traditional classroom-based instruction. Course discussions are conducted at Web-CT's discussion board, through e-mail and in chat rooms. Course resources are collected and linked on-line to support the course. Course outcomes include daily learning journals, curriculum-technology alignment projects that are eventually posted on-line and shared publicly.

The course "integrating technology in education" started from web-based discussion and to web-based instruction. It is at present completely delivered on Web. Its delivering modules currently consist of course instruction, practice, discussion, and project-approach online evaluation. With in course instruction, course materials and instructional objectives are delivered. Practice module includes practice guidelines and project examples. Students can follow the guidelines and refer to the examples while completing assigned individual projects. "Classroom" discussions are conducted through electronic mails, at discussion board and in instant message chat rooms. Students Learning outcomes are evaluated through projects completed with specific technological skills. All completed projects are submitted through e-mail and filed in learning portfolios for evaluation. Based on the experience of teaching online courses, the presenters believe that obtaining an effective web-based instruction, a teacher should have his or her instruction be involved in at least four phases: preparing, performing, following-up and evaluating (Hackbarth, 1998).

At preparing phase, teachers not only need to review course components, examine the facilities and personnel, and practice presentation through web, he or she should also have specific and measurable instructional objectives. The courses delivered on line should have general course objectives, more important is that each course unit or class should have clear and specific instructional objectives which can be assessed with the completion of each lesson. Developing a web-based lesson, the teacher should be fully aware of the difference between web delivery and classroom delivery. Web-based delivery has no face-to-face environment, no on-the-spot explanation, and no students' prompt feedback. Therefore, the instructional objectives for each lesson must be clearly stated before the posting and the delivery of the lesson. An Instructional objective is suggested to include learning goal, learning condition, learning performance and performance criteria. With a specific instructional objective, the learner at the distance can have clear idea what the learning is expected and how learning will be evaluated.

During the performing phase, a teacher need provide orientation of web delivery, elicit students' responses, and facilitate the learning with online delivering strategies. With WebCT, a teacher should realize that it has the features of lesson modules creation, chat room discussion, online test, etc. He or she, however, has to be aware of students' technological knowledge and skills of using computers and the web, their computer and Internet accessibility, and the effectiveness of the course delivery. Orientation will help students get familiar with the delivery tool, assist instructor to know students well, and have both instructor and students get together to make commitment for effective teaching and learning. Communication tools, such as e-mail, discussion board and chat rooms are the strengths of WebCT; however, delivering an effective lesson on the Web, a teacher should be prepared to manage the online instructional "time" and response to students' requests, questions, and/or submissions in a timely manner. A required online chatting and time of posting questions/projects are necessary and a strict deadline for assignment is important. Collaborative learning, sharing and project-oriented problem solving should be strongly encouraged and be highly credited.

Following-up phase plays an important role in Web-based instruction. Lesson modules, assignments, and online time requirement should be an on-going process of refining. For improving students' learning achievement, a teacher should face with the challenge of the rapid development of computer technology, students' increasing needs and bombard online resources. To schedule one or two classroom meetings with students during the period of Web course delivery will be helpful and is necessary. It will help teachers modify the instructional modules, update instructional materials and resources, and facilitate students' learning process.

At evaluating phase, a teacher should understand the purposes of and the means for evaluation in web-based instruction environment. The effectiveness of course delivery and the achievement of students' learning can be the criteria for course evaluation. Teachers have to be aware of the necessity of being prepared for multiple ways of evaluation since students are learning at distant places. The evaluations can be online tests, student activity roll calls, journal posting and sharing, completion of projects, as well as learning portfolios. One of the issues frequently raised about web-based instruction is that how can a teacher know the responses posted or projects submitted through online come from the actual student, not someone else. To pursue a meaningful evaluation on web-based instruction, teachers should realize that online tests are different with tests in the classroom: no on-site supervising. Online quizzes or tests can be used to measure students' learning achievement, however, multiple means of evaluation should be more stressed in web-based instruction.

In conclusion, the answer to the question raised at the beginning of this article-- "what we should know about the web-based instruction" is that he or she should be knowledgeable of this advanced delivery method. He or she must be a life-long learner and be willing to face the challenge of being accountable for student's learning achievement To obtain an effective web-based instruction, specific and clear instructional objectives are critical keys, strategic instructional time management and flexible collaborative learning environment lay down the foundation, and multiple means of evaluation guarantee the high quality of instruction and successful learning.

References

Elementk. (2000). How to plan, implement, and evaluate a successful online education pilot. Rochester, NY: Elementk. [On-line] www.elementk.com

Dede, C., bowman, J. & Kierstead, F. (1982). Communications technologies and education: The coming teansformation. In Howard F. Didsbury, Jr. (Ed), *Communications and the Future* (pp.181). NY: World Future Society.

Hackbarth, S. (1998). Integrating web-based learning activities into school curriculum. In Catherine Cunningham (Ed). *Perspectives: Instructional technology for teachers* (pp. 141-151). Boulder, CO: Coursewise Publishing, Inc.

Tiene, A. & Ingram, A. (2001). Exploring current issues in educational technology. Boston, MA: McGraw-hill.

Supporting and Evaluating Distance Learning Students' use of an Electronic Discussion Board

Richard Pountney
School of Education
Sheffield Hallam University
United Kingdom
r.p.pountney@shu.ac.uk

Alice Oxholm,
School of Education
Sheffield Hallam University
United Kingdom
a.m.oxholm@shu.ac.uk

Abstract: This paper deals with the introduction of an electronic discussion board into a paper-based distance learning phase of a post-graduate diploma in Teaching English to Speakers of Other languages (TESOL). It outlines the thinking behind the implementation of learner support through on-line discussion. The students' messages were analysed and a questionnaire used to examine and reflect on their contributions. Findings indicate that positive attitudes do not automatically result in high level of use and that the factors influencing this are varied. It goes on to describe a second, ongoing phase of implementation that is based on the lessons learned.

Introduction

The TESOL Centre has been running distance learning programmes for over 14 years and is experienced in dealing with the support issues that arise from distance learning, paper-based models. These include a sense of isolation from tutors and the institution (Edwards & Hammond, 1998), and problems with self-managed time (Mason, 1998). Other issues are the delays in sending and receiving work and a lack of contact, generally, with peers (McGee & Boyd, 1995). The introduction of online learning environments has had an effect on the distance learning tutor's role. Electronic conferencing provides a new context for learning and interacting, where both tutors and students are creating and shaping the learning environment (Salmon 2000). Computer moderated conferences and web based discussion boards fall into the category of text-based systems (Mason, 1998) that includes electronic mail, computer conferencing, real-time chat, Multi-User Dimensions, fax and many uses of the World Wide Web. *Discus* is a web discussion board software package that can be installed on a Unix, Windows 95/98, or Windows NT web server.

The Study

The Diploma currently has a 40-week paper-based distance learning phase followed by 4 weeks full time direct contact phase at Sheffield Hallam University. The TESOL Diploma students are, typically, experienced native speaker teachers of English, working overseas. Students are asked to submit worksheets by post on a regular basis (as many as 40 items). The subject tutors read these, assess them and give written feedback. This system would appear to be "ripe" for enrichment via ICT.

It was envisaged that the *Discus* discussion board would enable and encourage students to post-up questions/comments on specific modules and talk about specific tasks with other members of the group. A questionnaire was used to identify the students' computer background and canvass them on the tools. This showed all the students to have access to a computer, either at home or at work. While previous experience of ICT, email and the web was high the majority of the group had little experience with other forms of electronic communication. Face-to-face was seen as the most effective form of communication, followed closely by email. Interestingly, in a course that relies heavily on material sent through the post, surface mail was viewed as a relatively less effective method of communication. Electronic conferences and discussion boards were rated least effective.

It was anticipated that the main role of the tutor would be to set the tasks and moderate the responses. The students were given access to the discussion board and asked to use it to read and post up messages concerning the distance learning programme. Tasks were allocated to the students each week and these can be divided into three types: Social, Academic and Technical (Salmon, 2000). These were flexible, allowing tutors to follow students' threads of discussion for proceeding tasks if appropriate but in the main this did not occur.

Findings

Over the 6-week trial period student participation dwindled and there were very few new participants. The majority responded to tasks set in the early weeks where they were asked to comment individually on their work and give an example of their teaching. Responses and comments to each other were minimal, the main contribution being isolated responses to tutor-set tasks. It was found that a good amount of tutor time was spent responding to individual student questions and encouraging interaction.

Efforts by the tutor to raise key points for discussion based on the collated student responses from a previous task met with little or no response. One of the findings of this trial is that if the online tasks are offered as a non-compulsory extra then students tend not to use the online facilities. More active participation may well be evoked through the incentive of assessment.

A second phase of this research has been set up to examine these questions in more detail. A café area is now available for online socialisation to allow students to become familiar with the environment prior to being asked to exchange academic information. The academic tasks are now integral to a specific distance learning module, chosen for the level of student-perceived difficulty. The tasks will run for a specific time in order to focus students' attention and to develop their facility with the course material and the paper-based assessment tasks.

Conclusions

The success of moderation (McGee & Boyd, 1995) is dependent upon a number of factors. In light of this tutor intervention and its effect on the student response needs to be further examined. It is important to clarify what tutors and students are expected to do, and by when, and to be realistic about the amount of time a tutor can give. Students need access to adequate resources and technical competence and the software tools should be robust. The type of task set has a bearing on the perceived relevance and level of difficulty for the student and this can affect the degree of participation and satisfaction.

Tutors need to develop a clear sense of their audience and the composite needs of the group. There are implications arising from this for the training of online tutors. In particular student reticence in contributing, despite expressing enthusiasm for the tools, must be overcome for effective and integral use to be made within a course. Our research will continue to investigate this area.

References

Edwards, C. & Hammond, M. (1998) Introducing Email into a Distance Learning Course – A Case Study . *Innovations in Education and Training International*.35.4 319-327

Mason, R. (1998) *Globalising Education. Trends and Applications*. London: Routledge

McGee, P. & Boyd, V. (1995) *Computer-Mediated Communication: Facilitating Dialogues*
Available at http://www.coe.uh.edu/insite/elec_pub/html1995/173.htm

Salmon, G. (2000) *E-moderating. The key to teaching and learning online.* London: Kogan Page

Access for All: Developing an Online Course about Online Courses

Loye Romereim-Holmes
College of Education and Counseling
South Dakota State University
United States
Loye_Romereim-Holmes@sdstate.edu

Denise Peterson
College of Education and Counseling
South Dakota State University
United States
Denise_Peterson@sdstate.edu

Abstract: This paper is a report on the results of an online course that focused on online material development that can be used by a diversity of learners. The main focus of the course was on instructional design of web-based materials. An important element of the course was the use of Universal Design for Learning principles to assist designers in creating a course that can be accessed by learners with special needs. The outcomes of the class included feedback on the usefulness of the course, student projects, and discussion on the use of online discussion forums. Individuals planning on creating web-based materials need to be aware of the Universal Design for Learning research.

Introduction

The Internet is growing in use for educational resources. For many educators, the Internet is a tool to find, research, and discover materials and curriculum that can aid students in learning (Richtie & Hoffman, 2000). However, the Internet can also allow teachers to create materials for their students that are useful for learning. The challenge of using technology in these classrooms often is not access, but rather the teachers' development skills in designing instructionally sound curriculum incorporating technology.

Many teachers in this state's educational system are learning technology tools such as creation of webpages. However, just because teachers know how to create webpages it doesn't mean they understand how to create a page that is instructionally sound and universally accessible. Can all students access our materials? We need to design our courses with the awareness that access and usability are key factors in designing successful online courses. This paper discusses the development and delivery of a course that focuses on online instructional design that provides accessibility. The summer course, Web-based Instructional Design, provided learners with the opportunity to design an online unit and materials based on instructional design and Universal Design for Learning principles.

Project Background

The growth in educational use of the Internet for providing materials to learners has been tremendous (Beer, 2000). For the past year, the authors have discussed the idea of weaving the Universal Design for Learning principles used to provide access to individuals with special needs with the concept of instructional design. It was noted that both concepts were closely related and worked well within the framework of putting materials on the Internet. The thought was that if we could teach educators to understand both of these concepts, more web-based curriculum materials could be created to work with diverse learners.

Universal Design for Learning principles were created as a response to those individuals who have a disability that keeps them from accessing information and materials. Universal Design for Learning means the design of instructional materials and activities that allows the learning goals to be achievable by individuals with wide differences in their abilities to see, hear, speak, move, read, write understand English attend, organize, engage and remember (Orkwis & McLane, 1998). The principles for Universal Design for Learning were initially developed by the Center of Applied Special Technologies (CAST) and continue to be revised by CAST and other professionals in the special education communities.

Instructional design is the process of developing plans for instruction through practical application of theoretical principles (Dick & Carey, 1996). Most traditional models of instructional design can be categorized by five processes: needs analysis, designing the instruction, development of instruction, implementing the instruction, and evaluation of the instruction. Instruction is used to close the gap between what the learner should know or be able to do and what the learner currently knows. If there is a gap between the ideal and reality, we use instructional design to bridge that gap.

The decision to use web-based instruction should never be the first decision to make in putting together materials or a course; however, in education, we often decide to offer an internet course without considering whether the internet is the most effective way to provide the materials or the course. Web-based instruction is a media decision that should be made in the design stage of developing a course or materials for learners. The rationale for providing instruction via the web should be made based on instructionally sound reasons. According to Carlson, Down, Repman, and Clark (1998), some of these reasons include providing more convenient access to education, serving a previously underserved population, developing personal skills and expertise, and maximizing the potential for interactivity and linking.

The concepts of Universal Design for Learning and instructional design provided the framework for the course to offered. The main purpose of the course was exposure to these concepts so that educators would create materials that held relevance and be accessible to all learners while using the Internet resources. Designing materials with a purpose from the beginning may aid in increasing the quality of materials in the Internet.

Implementation of the course

Summer was an ideal time to try experimental courses. The authors put together a course called Web-based Instructional Design. The purpose of the course was to focus on using basic principles of instructional design, so that teachers could create web-based lessons that challenge and expand the horizons of the diverse learners in their classrooms. Web-based lessons could include complete lessons or supplemental materials. This course focused on the creation of curriculum materials that were accessible to all learners and provided adaptations to accommodate students with special needs. Students were introduced to topics such as needs assessment, Universal Design for Learning, and curriculum revision for web environments, diverse learning, assistive technology tools, and alternative assessments. This was a two credit hour graduate course meeting through two face-to-face meetings and online resources.

The goal of the course was to introduce web-based materials as a viable way for educators to assure student access to materials. The instructors put together the learning objectives of the course to organize the content. These learning objectives were based on the idea that the course would be a hands-on learning experience. This was important as each unit of study resulted in a project that required students to personalize their newfound knowledge.

The objectives of the course included fell into two categories: applying the principles of Universal Design for Learning and implementing the components of Web-based instructional design. The Universal Design for Learning principles were discussed in unit two where students examined the principles and discussed how these principles could assist the students in designing curriculum materials. The principles of Universal Design for Learning include: creating materials in digital text format; providing relevant captions for audio, images and graphical layouts and video; and providing cognitive supports and activities through the use of several instructional strategies as appropriate to the projects and needs (Orkwis & McLane, Fall 1998).

The components of web-based instructional design composed the rest of the course content. Students were walked through how to complete a needs assessment. Following the needs assessment, students were introduced to writing goals and objectives for their curriculum materials and how to design their instruction including making media decisions. The class also focused on practices that facilitated online learning. Finally students developed various digital curriculum materials and then assessed the materials. The class also discussed the importance in these steps to the development of an online course that meets the needs of the learners regardless of their diversity.

Both instructors worked together to design the content of the course with the idea that the technology would be introduced at beginning with a face-to-face meeting. One faculty member concentrated on the units dealing with Universal Design for Learning and assessment. The other units were created by the second faculty member including web-based instructional design, needs assessment, instruction design, and material development. Both instructors were available for student consultations as well as responding to online discussions.

The course had four students who participated through the online format. The course was designed to meet initially face-to-face and than continue throughout the summer as an online entity. It was decided that the class would meet for its final presentation face-to-face. The majority of learning would occur through online course materials and through threaded discussions.

The first meeting was on a Saturday from 9:00 a.m. until 3:30 p.m. and offered students the opportunity to learn the online technology that would be used throughout the course. Students were provided a hard copy of the syllabus, which provided the timeline for the projects within the online structure. Students were also given the opportunity to introduce themselves through an activity. A digital camera was used to document some of the proceedings as well as allowing students to post their picture to the course environment. Students logged into the class for the first time and discovered the many features of the online environment by posting a beginning biography. Following, the online activity, students were presented information about Universal Design for Learning as this was definitely a new topic for them and it allowed the class to immediately make use of the online chat feature.

The reminder of the eight week course was conducted through the online course environment. Students were asked to check the site at least once a week, as the units were a week apart. Discussion was relied upon heavily to clear up any confusion or to extend the topic. The final meeting was again a face-to-face meeting where students presented their projects to the class.

The course was set up so that students would look at various resources on web-based curriculum including information on the Center for Applied Special Technology (C.A.S.T.) website about Universal Design for Learning. Once students reviewed the materials, they were asked to read the summary written by the instructors and then comment on the issues and ideas brought up in the instructors' notes. Discussion was used heavily to clarify concepts and to further the ideas as we explored the area of web-based curriculum together. For each "unit" of content, the students were asked to complete an assignment that was part of the discussion on web-based curriculum. The units of study included: an understanding of web-based instructional design, analyzing learner needs, Universal Design for Learning principles, design and development, implementation options for diverse learners, and evaluation. Students were given learning tasks for each unit as well that focused on completing the project through the processes being taught. These hands-on experiences provided an opportunity to question their current practices. For example, during the unit on needs assessments, students were asked to put together a survey that would indicate the needs of the audience they were designing the web-based materials for. Once they would submit their assignments, both instructors would make comments and provide feedback to the students about their use of the instructional design principles and Universal Design for Learning principles.

Assignments ranged from reading assignments to a final project. Students created web-based materials that met universal and instructional design principles during the course. After most units, students were to respond to a discussion question that expanded their thinking about how the unit materials impacted their design processes. Often this called for reflection while practicing these new skills. Also, students were to complete an assignment for each unit that took them through the instructional design process step by step. Students were required to participate in the course discussions online. They also created a unit of study that was built upon the principles of instructional design and incorporated universal design for learning strategies. Finally students orally presented their project to the entire class showcasing the materials they created as well as sharing the process as it applied to them

Results of the class

The instructors learned many things from producing this course. The results offered several items to be considered the next time the course is offered. Many of the outcomes of the class provided both instructors with tools and processes they could use in future courses and training opportunities. Results were measured by the discussion forum, oral presentation and feedback garnered from the learners.

The final meeting gave all the students an opportunity to share their online curriculum projects. The projects were inspiring. One student was a faculty member who was going to begin an online course in the fall. The class gave her an opportunity to prepare the course using some guidelines and ideas that she would not have encountered otherwise. She ended up focusing her efforts on case studies and discussions. Another student developed a cultural course for English as Second Language (ESL) students and really focused on providing her students an opportunity to interact with students from the American culture. Another student developed mini-workshops for his students' parents on how to use things like digital cameras and developing PowerPoint presentations. A fourth student developed a series of sessions focusing on grief therapy complete with a vast array of Internet resources
Bibliography

Discussions were the lifeline of the course. The course started out with the instructors posting a deep thought question at the end of each module to provide opportunity for student reflection. The students would then take over the discussion forum. The students asked and answered many of the questions that helped to clarify and strengthen the content of the course. They also began to build a community amongst themselves. When one student had a problem or concern, other students would submit suggestions or resources that could be used in relation to the problem. All of the students actively participated in the discussion forum.

As the course took shape, we decided to include student-to-student discussions to increase the richness of the online experience. At the first face-to-face meeting, the class was given some guidelines and expectations of what the discussion should encompass. The guidelines were based on some of the suggestions made by Pratt and Paloff (2000), but other guidelines came about because one of the instructors was experienced in group communication and made suggestions based on that experience. Based on that classroom experience, a discussion grading rubric was developed for use in other courses. Currently, the instructor is conducting more research on the use of the rubric and its implications for online environments.

Students also indicated through an oral interview process that they gained much from the course. Several indicated that they had never before considered the Universal Design for Learning principles and through the class had become more aware of accessibility issues. Students encouraged consideration of offering the course again or even providing aspects of the course in faculty training.

Discussion and Summary

Based on student feedback, the course should be offered again. Students felt it helped them understand that online environments are different from the traditional design of materials for educational purposes and need to be planned carefully. The instructors also would like to offer the course again to improve it based on feedback and additional experiences. For example, more in-depth information about assignments was necessary to provide a guide for our students to develop their projects.

There is a growing need on our campus to help faculty understand the nature of putting their course online. The more one understands the guidelines of instructionally sound design, which includes creating materials for all students, the more effective the creation process of an online course seems to be. Through a campus grant, faculty will be offered the chance to take an in-depth training (online) on how to create a course that provides a sound instructional structure. Again the issues of diversity and access for all learners will be addressed as we further the concept of Universal Design for Learning.

The online course we developed was an interesting mix of web-based design exploring the issues of accessibility. The results indicated that we should plan on offering the course in the future and it may wind up on a degree program as an elective. Because of the course, the authors were granted an opportunity to examine first-hand the process of putting a course online which emphasizes good design and accessibility information. The experience was a positive one.

Literature References

Beer, V. (2000). The web learning fieldbook: Using the World Wide Web to build workplace learning environments. San Francisco: Jossey-Bass.

Carlson, R.D., Downs, E., Repman, J., & Clark, K.F. (1998). So you want to develop web-based instruction: Points to ponder. In SITE 98: Society for Information Technology and Teacher Education International Conference Proceedings 9th conference of the society, Washington, DC, March 10-14. (ERIC Document Reproduction Service No. ED 421 097).

Dick, W., & Carey, L. (1996). The systematic design of instruction. New York: HarperCollins.

Orkwis, R., & McLane, K. (Fall 1998). A curriculum every student can use: Design principles for student access. (ERIC-OSEP Topical Brief). Reston, VA: Special Project Council for Exceptional Children.

Palloff, R., & Pratt, K., (1999). Building Learning Communities in Cyberspace. San Francisco: Jossey-Bass.

Richtie, D., & Hoffman, B. (1996). Rationale for Web Based Instruction. Retrieved April 15, 2000 on the World Wide Web: http://edweb.sdsu.edu/clrit/learningtree/DCD/WWWInstrdesign/Rationale.html.

Romereim-Holmes, L. & Peterson, D. (Spring, 2000). *Web-Based Curriculum: An Instructionally Sound Solution for Universal Design for Learning Issues?* San Diego at the Society for Information Technology and Teacher Education 11th International Conference.

Distance Education: An Ultimate Subject for Teachers and Students

Osama Shata
Centre for Computing and Information Systems
Athabasca University
Canada
e-mail: osamas@athabascau.ca

Mahmoud Abaza
Centre for Computing and Information Systems
Athabasca University
Canada
e-mail: mahmouda@athabascau.ca

Abstract: In this paper, we use the term "distance education" to refer to the situation where computer-mediated technology is used as the main delivering media of courses of study, and where the teacher and the student are physically in two different locations. Many research papers discuss the reform of high school education and deal with issues such as the new technology and computer mediated curriculums without discussing the role that distance education may play in this reform. Other papers discuss how to improve teachers' knowledge of certain subject areas and only address distance education as a way to make teachers' professional development more flexible in terms of time and space. This paper takes a different approach in claiming and justifying that taking a course at distance should be part of the high school curriculum, and that students need to experience a form of distance education even if they plan to continue their study at traditional institutions. Moreover, this paper also claims and justifies that distance education is a key factor in teachers' good teaching at traditional schools.

Introduction

Distance learning has been mainly characterized as a popular method for adults who need to "upgrade." Typical advantages listed include the flexibility that learners enjoy in terms of time, place and pace of learning. However, the continuous change in computer-related technology have given distance education more credibility by improving accessibility to courses materials on the Web and by improving the availability of electronic equipment that enables students to participate successfully in completing courses at distance. Also, the vast and continually growing Web and the overwhelming increase in the use of the Internet and technology will have an impact on the traditional methods of teaching and learning. We claim that students, after completing their high school education, will most probably have to experience distance education in their ongoing life, either on their way to get a university degree, or to broaden their experience and to qualify for better jobs. Studies show that personal prior experience and acquired knowledge about a certain discipline makes new advances in that discipline easier to grasp, and helps students overcome potential barriers to coping with such new advances. In this context, it can be demonstrated that students taking distance education courses after having some work experience, especially with technology and computer mediated communication, have a better completion rate than those students who take courses at distance without that experience. Recent research suggests that in the new technology-driven economy, a worker may be expected to change her or his career few times before retiring. A worker may need to learn the skills needed for a new job while s/he is working. Distance education may be the most feasible way for learning the new required skills in that situation. In high schools, students learn basic skills that help them learn, but mainly in a face-to-face environment. We claim, and justify in this paper, that students will very likely need to take courses at distance in later life. Hence, they should be well prepared for it. This paper is designed to explore the need for introducing distance education in high school. It begins with an explanation of our view. Secondly, there is a brief presentation of the associated problems, followed by a description of a modified model for high school students to complete such a course at distance. This model will serve as a transitional form of learning between the common models of face-to-face and the distance education. Thirdly, a description of the content of a course that we recommend for high school students to take at distance. Fourthly, the role of teachers in this transitive model is addressed, as well as what teachers need to know to play a successful role as facilitators in our suggested model. The paper concludes by justifying the need for teachers to learn how to use technology through distance education rather than in a traditional environment.

Distance Education is an Ultimate Subject for Students In Schools

The author teach in a leading institute for distance education and are aware of the difficulties that encounter students when taking distance education courses. We believe that students, in high schools, must be well prepared for dealing with distance education courses. Students of high schools may be classified into the following four categories:

1. Those who will join a traditional university. Traditional universities do not offer all courses needed by their students all year round. At certain times it is very likely that a student will need a courses or more to graduate and such courses are not offered in the semester that student needs them in his / her home university. Hence, the only valid option in front of that student is to take that course(s) via distance education.
2. Those who will work and study at the same time. In such a case, distance education is the ideal route for that group of students. So, it is very likely that this category will go for distance education because such category does not have time to attend a traditional university (e.g. have work schedule conflicts).
3. Those who will enter the work force after completing their high school studies, and will not go directly for continuing their higher education. The following argument will also apply for (a) and (b) above as it applies for most workers who may enter the work force at any point. Suresh Dinakaran (Suresh 2000) states that: "the idea of having a single career in one business or industry is long gone. Several papers and articles suggest that, on average, a worker in the new economy will have perhaps as many as seven careers and many more 'jobs' before retiring". We believe that distance education may be the most viable option for those who need to upgrade either to maintain their competence or to qualify for a better / new job due to its well-known advantages such as flexibility in terms of time and space.
4. Those who will neither continue their higher education nor will work. In case a member of this category decides to change his / her situation and join one of the above categories then the relevant argument will apply.

The above classification claims that students will need to experience distance education at sometime of their ongoing life. Students usually face considerable challenges in their distance education in general and in their first course in specific. The first impression they get from their first course can affect their decision whether to continue with this mode of learning or not. Next, we will briefly list few of the challenges that face students while learning at distance. Such listing will help explaining our suggested transitive model.

Challenges Associated with Distance Learning

Some distance education programs use a variety of "real time" technologies such as teleconferencing and videoconferencing. This requires that students gather in one / few locations to be able to use the voice and video equipment to communicate with the instructor for the conference, or at least, students must be available for the conference at the same time. This means imposing some constraints on students who selected distance education primarily for its flexibility. Statistics show that most students who opts for distance education do so because their circumstances prevent them from being committed to a fixed studying schedule. This implies that a distance education program that depends on teleconferencing, videoconferencing, or other real time media may not be suitable for them. Also, in a typical distance education program students are spread among different geographical areas with different time zones. This makes using any time-bound technology unsuitable. The distance education program we will focus our discussion on is the one that delivers the course material on the Web, accompanied by printed textbooks. In this program, the material on the Web consists of a study guide that explains and compliments the printed textbooks, and of a set of on line assignments and / or quizzes. Students contact tutors primarily via e-mail and get feedback via e-mail. Students have access to courses' conferences where students can read and reply to each other's posted messages at the time suitable for each student. Next, we will briefly identify the main challenges that a distance education learner usually faces, in a similar program to the one described above, in order to come up with a transitive model.

1. Isolation

Student may get the feeling of being isolated from other students and from the instructor because s/he misses the face-to-face contact with the instructor and with the other students. Some educators suggest to students that a technology such as videoconferencing may help overcoming this feeling. We find that real time technologies are not suitable due to the reasons mentioned earlier. Students already know that the nature of distance education differs from that of the traditional education. We do not have to provide an equivalent substitute for face-to-face communication. However, distance education learners may use computer-mediated technology for contact such as e-mails, chat rooms, computer conferences, and MOOs. It is a matter of practice. When students get used to this technology they will overcome that feeling of isolation. Complaints regarding isolation usually come from students taking their first courses at distance. Such complaints usually disappear after completing a second course at distance. An example from real life that may explain the previous argument is buying over the Internet (e-commerce) versus buying from street malls. Buyers over the Internet cannot touch the product, but they know that they have traded touching the product with the convenience of buying at home. As e-commerce is growing tremendously, distance education is also growing tremendously. Distance education learners have traded the face-to-face contact with the convenience of flexibility in time and place of learning.

2. Planning

Some students lack adequate planning that enables them to complete the course of study in time. When student signs for a course s/he is given few months to complete the course (say six months). The student is asked to submit all course work within the specified period without specifying deadlines within that period (e.g. does not have to submit each assignment on a specific date). This is to accommodate for learners' circumstances such as traveling or peak periods of work. Each course offered at distance is usually accompanied with a suggested study plan as a guide for students but it is not enforced. Students need to learn to determine deadlines for themselves and to meet those deadlines.

3. Motivation to complete the course

Some recent studies mention that distance education courses must provide a sort of motivations or incentives for students to encourage them to complete the course of study.

4. Managing technology

Students who use computer-mediated communication for the first time usually encounter this difficulty in their first course taken at distance. Once they acquire the basic computer skills and trouble shooting they proceed with more confidence.

5. Students' collaboration

It is very difficult in distance education courses to

6. Real time feedback from the instructor

Although there is no casual contact between students and teachers in distance education, but students receive feedback promptly from their instructors. Usually in the same day, or in the following day at the most.

7. Students' support Services

Students taking courses at distance, usually need library services and technical support in downloading the course material from the Web, installing new software, logging in to computer conferences, contributing to chat rooms, … etc. Due to students' lack of the protocols of using or receiving such services, they think that distance education programs lack adequate students' support. However, in reality, technical staff available, in distance education program, to assist students is usually available for extended hours (could be 24 hours a day) and may have greater experience in computer mediated technology than that of traditional programs. Also, libraries in distance education programs, provide students with comprehensive online resources and journals

In many cases those resources exceed those provided through traditional programs libraries.

A Suggested Transitive Model

The model we will introduce next takes in consideration the challenges discussed in the previous section. This model will be used to deliver the suggested course in an asynchronous mode with some synchronous features.

Features of the transitive model:

1. A self-paced course that uses a printed textbook that discusses, presents, and explains the course contents. The course has an online component used for sending questions, submitting assignments and quizzes to the teacher, and for receiving marks and feedback from the teacher. This is mainly done by e-mail. The course also has a computer conference where messages and news related to the course are posted. Students also download from the Web a study guide and a suggested study plan. This is the current predominant model used for distance education.

Part of the frustration of students taking online courses at distance is that they expect a virtual environment that substitutes all features of the face-to-face environment. Students expect the excessive use of multimedia to substitute teacher's explanation of the material. They expect videoconferencing to substitute the face-to-face interaction, … etc. Most distance education programs do not use such real-time technology for the reasons explained earlier. However, it makes much difference to students to try a technology themselves and see that it is inadequate rather than just being told that it is not inadequate.

2. The online component here would consist of real-time video / tele conference at scheduled times between the teacher and students to clarify course assignments and other matters related to the course.

3. The online component may consist of animated-based capabilities.

4. The teacher will suggest a study plan with deadlines for completing units of the course and for submitting the assignments. Those deadlines must be enforced in order that student learn how to manage their studying time.

5. Students must be committed to log in to the course's computer conference at least four times a week and to contribute to the course's bulletin at least twice a week. Also, students must be committed to login to newsgroups and / or public chat rooms and to online journals once a week.

6. Students must be committed to meet a minimum number of sending e-mails per week to the teacher.

The goal of 4, 5 and 6 above is to help students to get used to using conferences, bulletins and e-mail. Such features are optional in real distance education programs. Students joining distance education programs for the first time are usually hesitant in using those feature due to their lack of . However, by making using those feature compulsory in this transitive course, students will consider them routine activities when they join a real distance education program.

A Recommended Course

In this section we recommend the contents of the course that to be taken by students at schools within the transitive model.

1. Enabling Technologies

Students must learn about the technology tools used for delivering a course at distance such as browsers, videoconferencing, teleconferencing, computer conferencing and the Internet. Some distance education programs do not use tools such as videoconferencing, because they are time-bound as we mentioned earlier, and do not use excessive animation, since it requires long time to download. Students must experience those difficulties in order to understand why some programs do not use them.

2. Collaborative Technologies

Chat groups, bulletin boards, groupware, message boards and other interactive technologies help students to interact successfully with other students and not to feel isolated.

3. Operating Systems

Popular operating systems such as Microsoft Windows and Unix should be covered in that course. Students

who lack the technical skills to manage their computer environment usually spend part of their valuable study time in solving their problems with technology. This causes those students some frustration in their first course and this feeling may affect their enthusiasm to complete their courses at distance.
4. Basic Computer Skills and Trouble-shooting
Learning computers' troubleshooting saves students valuable time, and gives them self-confidence. It will help students to learn how to identify symptoms of problems, possible causes, and what to do, or whom to contact to solve the problems.

Teachers' Role in the Transitive Model

Teachers in on-line classrooms play the role of facilitators rather than educators. While students have course materials and studying guides to read from, teachers need to have tools to stimulate learning by starting and directing dialog in class conference rooms and related chat boards. Experience has proven that teachers should pose themselves as participants in the classrooms rather than authority. By being mere participants classrooms, teachers give students a better chance to get the perfect understanding of the taught idea.

The most important educational instrument a teacher should add in on-line education is the careful design of study guides. Study guides contain general teacher's comments on a chapters, and discussion questions. Careful design of discussion questions is, in fact, the most crucial in crystallizing the objectives of a chapter. Discussion questions should cover all key ideas in the text in a very logical and guiding manner. For example, a discussion question should be designed to lead to another question, and then to a third and so forth, until the idea is fully absorbed by students. While monitoring student's discussion about those questions, a teacher might choose to revise questions for future use, in addition to directing students to grasp the ideas behind.

Teacher's participation in on-line classrooms is an art by itself. We recommend that teachers make their contribution short, precise and to the point. It is obvious that computer-mediated education relies on reading and writing versus listening and writing in conventional classrooms. Students would need to read a lot while studying the textbook. We find that students eventually imitate teachers in the style of contribution to discussion, which we strive to make it short and meaningful.

Among other factors to train teachers for, is to improve social relationship between students. In the on-line classroom, students need to interact more than they do in traditional classrooms. Teachers should be able to maintain the class as a single unit. Cohesiveness in classrooms can be maintained by involving all students in the discussion. For example, a particular student is requested to respond to a certain posting made by another student. Thus, each student is made to talk to every other student in the classroom. Moreover, teachers should encourage individuals' participation, to get the most of this model.

With an active on-line classroom, there is a new set of student problems that a teacher should be prepared to deal with. Some of these problems do exist in traditional classrooms, but they are more serious in on-line classrooms. Examples of these problems are: a student expressing his frustration in the classroom, a student who wants to impose his own learning model, a student who distracts other students by side issues and quarrels, a disrespectful student, and alike. The most important guideline to deal with student misconduct is to reprimand in private and praise in public. Students are ideally reprimanded via electronic mail, till the problem mandates a face-to-face discussion.

Unlike traditional classrooms, on-line classroom is full with distractions for students. A teacher might find his students busy with unrelated material on the computer, instead of concentrating on the class. Teachers should be able to discover, as early as possible, their students as they drift away and bring them back in a reasonable time. Since we are dealing with a transit model of distance education, class monitoring is easy while the teacher is present in the classroom with students.

While discussing a class subject, students might branch to side issues or develop an incorrect understanding of a subject concept. Discussion in on-line classroom takes the form of a thread of message exchanges. A one opinion usually draws several student responses. Naturally, some responses to an idea contain many branched issues. Subsequent responses might carry discussion away from the idea under focus. Therefore, teachers should be vigilant and follow closely so as to discover how students understand the taught subject. (Beaudin, 1999).

Student evaluation is one of the most critical issues in distance education. A teacher should be able to evaluate student's efforts, and produce accurate grades. By being around during discussions, experience has shown that teachers are very well aware of their students' achievements.

Distance Education: an Ideal Route for Teachers to Learn Technology

Teacher's are in dire need to upgrade their computer skills, since computers are increasingly becoming an all-purpose tool in schools. Students are finding more than word processing and report producing in computers these days. Hence, teachers need to cope with the new computerized classrooms. Moreover, computers continue to develop at a fast rate, so are software teaching aids and tools. There are so many software packages designed for education, and much more is still to come. With the advent of computer technology, more sophisticated software packages are expected to emerge. (Harris,1997).

Teachers should also learn paradigms for on-line education. Learning the paradigms enable teachers to know what is available at their disposal and how to make use of it. The major paradigms currently in use are: computer conferencing, on-line material, homework submission and instant grading, interaction with students, and audio and video clips of lectures. Teaching on-line cannot continue to follow the same old model. Therefore, students should be trained to learn the new way, before being seated behind computers. More importantly, teachers themselves should also to be trained to apply these new methods. (Bourne,1997).

To upgrade teachers skills to the level of computerized schools, training should cover two aspects: teacher's technical and methodical development, and development of teacher's ability to handle students in this new environment. Because of time constraints, most teachers cannot afford to join schools and training programs of their choice. Distance education provides an invaluable opportunity for these teachers to upgrade their knowledge while staying at home and following their own schedules. We recommend that teachers complete upgrading course using distance education for two reasons: a) prepares teachers to teach in the new environment, and b) make teachers appreciate the usefulness of this mode of learning.

There is countless number of other benefits that teachers can gain by seeking opportunities provided by distance education. For example, getting to know new colleagues, subscribing to on-line libraries, being up-to-date with new inventions in own fields, and etc.

Conclusion

Computer-mediated distance education is already in wide use today, and we believe that it will play even a greater role in shaping future education. Current learning model used in high schools follows a totally different philosophy than the one used in distance education. To prepare students for the new model, we presented a transitive course that facilitates smooth transition into distance educational learning model. We suggested suitable subjects that have more than one purpose while transforming students into self-learners. Finally, we define a new role for teachers to play in this new environment.

References

Beaudin, Bart P. (1999). Keeping Online Asynchronous Discussion on Topic. *JALN Volume 3*, Issue 2-November 1999

Bourne, John R (1997). Paradigms for On-Line Learning. *JALN Volume 1*, Issue 2-August 1997

Dinakaran, Suresh. *Distance Learning: The New Imperative.* Online resource: http://www.educationtimes.com/distance.htm

Harris, Judi. (1997). Teaching Teachers to Use Telecomputing Tools, *North West Educational Technology Consortium*

Haughey, Margaret & Anderson, Terry (1998). *Networked Learning: The Pedagogy of the Internet.* 1st Edition. McGraw-Hill Ryerson Limited

Simonson, Michael & Smaldino, Sharon & Albright, Michael & Zvacek, Sus(2000*). Teaching and Learning at a Distance: Foundations of Distance Education.* 1st Edition, Printice Hall.

Twigg, Carol (1994). "The Need for a National Learning Infrastructure." Educom Review, September-October 1994.

Managing the Dark Side of Online Courses While Enlightening Your Online Students

Judith M. Smith, Ph.D.
Vice President, Instructional Development
CertiLearn, Inc.
Herndon, VA, USA
Jsmith@certilearn.com

Abstract: For every online distance education program launched, there have been five online distance education programs that have either failed outright, or have been deemed unprofitable, because they were launched without benefit of prior research. This is what we term the "dark side" of online education -- for every success, there are numerous failures that provide important strategic learning lessons as we move towards a more technologically enhanced world of education.

Introduction

Nonprofit associations are considering new ways of using educational technology to provide continuing professional development to their memberships. Most association professionals have reported a desire to increase their use of technology to meet continuing education requirements, as necessary to maintain professional certification, but either cannot find the time or the funds (simultaneously) to make this a reality. The more critical problem is that the majority of associations neither have the staff nor the technological expertise to provide online education themselves. While associations understand that online education offers many opportunities to correct this situation; from a managerial aspect, they are unable to work with the variability and continuous change, and the management of "the unexpected" that is online technology at present. This uncertainty is defined as "the dark side" of online education. Much of the uncertainty originates from the association staff and members': lack of experience with online learning; lack of understanding how to migrate a course from traditional to nontraditional platforms; and, lack of understanding how to facilitate a course in the online environment.

These are critical issues, since they impact the association members' persistence in online education. Without a clear understanding of how to develop, manage, and maintain online courses, many association education programs have either failed outright or have been deemed untenable for long-term investment or development. This study attempts to identify those issues that lead to the "dark side" of online education for associations, and provide guidance for associations implementing online education programs. It is in understanding how to best manage the tool of online learning, and how association professionals can be trained to manage online education that can illuminate the dark side, and provide good learning opportunities for adult learners.

The Study

The research examines how educational programs are developed and staffed, starting with the traditional program, and how that program is selected, developed, and maintained for deployment via nontraditional technology. The research also explores how staffing and administration is impacted across the association, since most of these non-profit groups consist of a small staff team (under 50), who are often responsible for performing multiple professional duties simultaneously. The study also explores how associations evaluate online platforms for deploying their online programs, and most importantly, how the associations prepare both the internal staff and the external adult learner-user for online education. Finally, the research explores the impact of new nontraditional learning on existing traditional learning, the motivations to develop association online education as an option, and how online education fits into the overall business strategy of the association. This study is in progress and expected to continue over the next several years as online learning technology evolves into a viable learning platform.

Findings

At present, the findings are inconclusive, because the research is ongoing. However, a overview of current data on the associations reveals the main issues at the heart of the "dark side" with association online education is a lack of understanding: how online education fits into the current business model; how online education requires different and various budget requirements than other departments within associations; and, how online education requires a heightened support team (both from the technical and the educational teams).

Conclusions

While any conclusion is considered early at this stage of the research, it is hoped that the specific findings from this project result in the development of guidelines and an assessment tool for associations to use in creating viable online education opportunities and options for their members.

References

Cuban, Larry. 1986. Teachers and machines: The classroom use of technology since 1920. New York: Teachers College Press.

Harasim, Linda and others. 1997. Learning networks: A field guide to teaching and learning online. 3rd ed. Cambridge, Mass.: The MIT Press.

Knowles, Malcolm. 1990. The adult learner: A negledted species, 4th ed. Houston: Gulf Publishing Co.

Nadler, Leonard and Zeace Nadler. 1994. Designing training programs: The critical events model. Second ed. Houston, TX: Gulf Publishing Co.

Turoff, Murray. Alternative futures for distance learning: The force and the darkside. April 1997. [http://www.rh.cc.ca.us/projects/flashlight/]. September 1998.

Reflections of K-12 Teachers on Graduate Education via Distance Learning

Bill Stinson
Emporia State University
USA
Stinsonb@emporia.edu

Mark Stanbrough
Emporia State University
USA
stanbrom@emporia.edu

Abstract: This presentation will describe a recently NCA approved online delivery of a graduate teacher education that has been developed to accommodate the needs and interests of K-12 teachers in the field. The surveyed needs and technological capabilities of these teachers will be discussed along with the reflections of their experiences with receiving professional information in a distance learning delivery system. Also, the structure and functioning of these courses will be highlighted along with how they are used to foster ideas among K-12 teachers for using this approach in their own classroom settings.

University teacher education programs must realize that technology-based education is here and is rapidly changing each day. Our intent is to relate how we have met the challenges of recent trends in education suggesting that the demand for information technology-based teaching will grow in the next decade and this technology will change teaching and learning profoundly. It is imperative that our teacher education programs incorporate technological strategies currently being endorsed in public and private schools. Our presentation will not only show how we are utilizing educational technologies in innovative ways for teacher excellence and improving the delivery of our teacher education system to a wider professional audience, but more specifically the reflections of K-12 teacher involved in an online graduate program.

As an introduction to the reflections of K-12 teachers in our online graduate program, it is important to relate how this online program emerged as delivery system for our graduate teacher education program. The following scenario is a case in point. The authors had developed a new on-campus course for the Division of Health, Physical Education and Recreation (HPER) at Emporia State University entitled, Analysis of Teaching/Coaching, which it was felt would be an "attractive and beneficial" offering to teachers in the field. A disappointing enrollment and its cancellation thereof prompted the authors to investigate the potential of various educational technologies in order to see if a different packaging of the course would increase its future enrollment and better serve our mission as a teacher training institution. It was evident that an alternative approach had to be developed for this course and others in our graduate teacher education program to survive.

Surveying and marketing strategies became an important component to the feasibility and type of distance learning approaches applied to an alternative course delivery plan. Initially, a hard copy and on-line survey assessing the attitudes and opinions of over 200 teachers throughout the state of Kansas was accomplished on the distance learning potential of our graduate and re-certification courses. These results gave us an idea of the types of courses and approaches that teachers would desire. These results have been subsequently reflected in the course evaluations of 40 online courses encompassing the 1996-2000 academic semesters. More recently, the findings of a comprehensive study of online graduate courses in HPER at Emporia State University, Virginia Polytechnic University, and University of Texas – Permian Basin reinforced the above findings. The following reflections are the combined findings of the above surveys.

Reflections

Flexibility of courses. For the most part, teachers liked the concept of "anytime, anywhere" course offerings and course work fitting into their work/personal schedules. One problematic issue some teachers expressed, was recognizing virtual vs. real time in getting work done. In other words, since I don't have to be somewhere at a certain time; then, I will just do it later.

Time/Travel management. With busy professional schedules, the idea of not having to fit in driving time and away time from families was an attractive option for taking classes.

Development of new technology skills. In order to participate in a distance learning class, various technology skills of word processing, class web site navigation, internet searches, emailing, and forum discussions actually had to be learned. Class evaluations not only showed that improvement in technology skills was a by-product of the online class; but these skills were being used by teachers in other professional endeavors.

Well-structured courses. Because of the nature and necessity of distance courses being displayed ahead of time and assignments clearly spelled out, teachers liked the fact that courses were well-structured, many resources were readily available and accessible online. The downside for some teachers with this format was that unclear, confusing instructions and "glitches" in the technology could restrict access to certain resources for completion of assignments.

All allowed to participate. Two dominate issues arose regarding the use of forum discussions and live chats. As a whole, forum discussions received favorable reactions in that they allowed everyone to express an opinion on a topic, not just dominate class members as in many on-site classes. There were some individuals who did desire to have the face-to-face interactions, which is not available in most distance learning classes.

Diverse student populations. The very nature of a distance class allows teachers from literally all over the nation and world to be in class together. This component was an impressive one for teachers. It allowed them to meet not only new professionals, but to become enlightened concerning teaching experiences and educational issues of other professionals.

Writing skills. Since much of an internet-based class utilizes email, forum discussions and other written activities, teachers expressed improvement in writing skills since many others would be viewing their opinions and their correspondences. Obviously, some students expressed stress and anxiety that their written communications would show a lack of skill and knowledge.

Instructor/student relationships. A critical element cited by many teachers was the availability and camaraderie associated with knowing the instructor. Several suggested having a short video clip of the instructor welcoming the class or a portrait picture on a web site as a way of forming an impression of who am I corresponding with or discussion on the forum. Also, virtual office hours and timely email feedback were items that tended to help "personalize" the course and establish that "a real person" was teaching the course. An increase in the number of students per instructor tended to diminish the personal touch student sensed in taking an online class. Any personal activities which highlight and introduce classmates to each other such as student information web pages and/or icebreakers tend to develop stronger intra-class relationships.

Selected Quotes of K-12 Teachers in Distance Classes

The following are actual quotes from teachers enrolled in the online graduate masters degree program at Emporia State University. These quotes reflect much of what has been described in the above summation.

"Living in a small rural area with limited educational opportunities, Emporia State University has given me an opportunity to pursue my masters degree in HPER. The courses I have taken have proven to be practical, challenging, and beneficial to me as a physical educator."

California teacher

"With teaching, coaching, a husband and two small children, I don't have time to sacrifice a night each week to go to classes. This way, I can work from home when its convenient for me. I feel I am getting a quality education."

Virginia Teacher

"These kinds of courses are wonderful. I live far away from big cities, so I have travel two hours to get a class. I would not have had the opportunity to increase my knowledge in ;my profession without the Emporia State University program."

Argentina, South America teacher

"This program allows me to work towards a masters degree while holding down a full-time job half way across the country from the campus. I was surprised how much I could learn through online courses."

Alaska teacher

"The main problem with online instruction is that I don't receive immediate feedback from the student/professors when we talk about an issue. Sometimes meanings can be misconstrued because it's hard to tell "how" somebody is saying something . . ."

Anonymous

"Less interaction with instructors."

Anonymous

"I feel the quality of VA tech's distance learning program makes it a much stronger program than the traditional college program that I took 8 years ago. I feel that I have learned much more appropriate skills to make me a better distance educator.

Anonymous

Conclusions

Innovative teaching techniques must be developed to keep up with the flux of information. Technology is impacting research, classroom teaching, and distance education in all fields of education. Distance learning delivery systems have become a focus of educational programs, not only at the university level but in the K-12 setting as well. We in higher education need continue to explore various distance learning technologies to better serve our mission of teacher training in the "new" millennium.

From "Inches" to "Miles": Web-Enhanced Instruction Using WebCT (Version 3.1)

Ingrid Thompson-Sellers
Business Department
Georgia Perimeter College
United States
Ithompso@gpc.peachnet.edu

Abstract: This paper is a report based on the design, pilot study and teaching of on-line courses, using the WebCT program as a method of course instruction and delivery. The courses involved in the study were freshmen/sophomore computer literacy courses, one being concepts-based, the other more hands-on type involving computer applications. Based on the differences with respect to requirements of the students, desired learning outcomes and delivery method, the study showed more success in one type of on-line course versus the other. Success was measured by comparison of final grades in the on-line courses with those of face-to-face classes being conducted at the same time. Both on-line courses required an alteration in teaching methods to suit the more technology-based environment.

Introduction

"The demand for educators to respond to the needs of diverse students is no longer an issue for the future" (Armstrong, 2000, Timm, 2000). Changes such as our student population (age, ethnicity, country of origin), instructional methodologies and pedagogy and physical location to name a few are issues that need to be addressed. As educators, it is our job to ensure that learning continues to be a positive experience, irrespective of the changes that are at hand. The role of the teacher is also changing to more of a facilitator rather than instructor. There has been an influx of new technologies available to us as educators to act as tools for enhancing learning, and therefore add more to the changes that are already taking place. "Technological advances have given teachers a number of classroom management and instructional tools" (Jones, 2000). In addressing the issue of technology, a part of the title of the paper comes to mind "..from inches to miles". The whole concept of this statement centers on the fact that in embracing any form of technology in the classroom, there are varying degrees to which one can incorporate it into the learning process. Technology should be viewed as a tool, such as a chalkboard and chalk would be looked at, and definitely not a substitute for a teacher. It introduces new methods of teaching rather than teaching new concepts or ideas. Certainly there is additional knowledge involved with learning a new skill, but the content and context of the material should be the same. Due to the influx of these new technologies, some of us as educators have raised our expectations of students with respect to familiarity with computers. Certainly, most institutions today, are requiring certain competency with respect to technology, of our students, by introducing some form of computer literacy course or test before being able to graduate from our schools. There are a vast number of technology tools available for the educator today. Physical hardware which assists in the classroom could start with a simple computer attached to an overhead projector which would take the place of transparencies and an overhead projector, to a "smart classroom", with sophisticated "smart boards", digital video disk players, overhead projectors etc. Software programs could range form a simple word processor, or e-mail program, to web-based educational tools that let you create distance-learning courses to deliver to your students outside of the traditional classroom. The selection of the integration of technology will depend on various factors unique to each individual as an educator, as well as each institution. There are also certain basic methodologies to follow if you will be integrating the technology for the first time, versus approaching the "miles", where you might have been some-what familiar with certain programs and physical hardware. It will take time, effort and a lot of implementation of plans B and C, when technology might just fail us. The most important thing is that these new technologies should in no way change our overall content and objectives of our courses. The material being taught should remain the same irrespective of our methods. Certain methodologies will inevitably change with respect to how our objectives are achieved. We also have to find some way of measuring our outcomes and comparing this with the traditional way of doing things. A process has to go through a series of refinement. The fact that this does not work the first, second or third time doesn't mean that it might not work the fourth time.

Also, there is always room for improvement, so we should strive to improve the process from time to time. "Distance education is first and foremost a movement that sought not so much to challenge or change the structure of higher learning, but to extend the traditional university and to overcome it's inherent problems of scarcity and exclusivity" (Matthews, 2000). There are currently more options available to the student since the idea of distance learning emerged. "Unless you've been asleep for the past five years or so, you are well aware that more and more colleges and universities are turning to the euphemistically-phrased "distance learning," as a way to increase student enrollment and meet the public's demand for convenient access to higher education" (Goodson, 1997).

Preparation

Before efforts could get underway to start developing a distance-learning course for web delivery, an entire summer was dedicated to training and developing the skills necessary to undertake such a job. Participants had to be dedicated and committed from start to end and were given an incentive of a distance education fellowship grant. There were varying degrees of technology experience of the participants, so all courses were broken into at least two levels, basic and advanced, so that all participants were reached irrespective of their skill level. Topics covered varied from e-mail, file management, web authoring to HTML coding and WebCT. At the end of the summer, participants were expected to follow a time-line for the upcoming semester, to start developing their on-line course(s). A part of the timeline involved actually using the on-line course material as a pilot in the face-to-face traditional classroom environment, so that changes could be made and students could contribute to the future learning process of fellow students.

Pilot Study

The software program used to develop these on-line courses was WebCT. The courses that I chose to develop were both computer literacy courses, one being concepts based, the other more hands-on with respect to the computer. I chose to conduct the pilot study using two face-to-face classes that were the same courses as the ones being developed for on-line delivery as well as a business information course, being taught the very same semester. Both computer literacy courses were weighed one credit hour each, and the business course, three semester credit hours. In all three cases, the students had to be instructed as to how to use the program, before they felt comfortable enough to attempt the exercises that were required of them, using this program. Even though we were using this program in addition to having class meetings, students were required to attend the face-to-face class. Students were rated on the discussions and assignments given in class, and also those conducted in the WebCT program. As far as student's reaction to this technology, certain features were more popular than others, such as being able to constantly view your progress. Some students did not see it necessary to go into the on-line portion of the course after a time, as well as some stayed dedicated to the end. The business class however, continued using the program in the absence of their teacher, who went out on maternity leave for six weeks during the semester. On my return at the end of the six weeks, we continued classes as if I had never been away, since they were able to continue with discussions, assignments and communicated constantly with me via e-mail and the bulletin board feature of the program. At the end of the semester, the expected results based on students' grades were within the same numerical ranges when compared with other past courses, for all three pilot courses. There were also changes that were due to errors in data and also refinement of assignments and methodologies that were implemented, at the end of the pilot study.

On-line Implementation

Students were required to attend a face-to-face orientation where students got a chance to meet faculty, and requirements for these courses were highlighted. The distance education program ensured that all students' hardware and software were compatible with the distance-learning environment by requiring them to do a demo course, before actually starting their courses. Teachers in the distance-learning program could choose a separate text from those being used in the equivalent face-to-face classes. I chose to use the same text in both instances, primarily because of me being very familiar with it having taught the courses on several occasions. Each on-line course was conducted separately, one during the first half semester, the other second half. The concepts course was the first to be implemented, followed by the hands-on course. The first course started off with few incidents such as unavailability of textbooks, students not knowing where to begin or what to expect, not unlike the issues of a face-to-face class. The communication with the students was initiated by the students, as another requirement for them is to e-mail their instructor in order to commence the course. However, if a student was listed as enrolled in the course, but did not initiate communication by the end of the first week, then they were contacted via telephone. The students' login information and password was e-mailed back to them so the course could begin.

The kinds of assignments that were conducted in class were timed on-line quizzes and exams, group discussions, textbook assignments and group projects. There were on-line office hours for the students to interact with the instructor, and the hours included late evening and a weekend day to assist students who could not have been able to participate had it been during the week only or during regular business hours. Within the class, there was a wealth of diversity due to age, physical wellness, country and state of residence, which would not be possible had this been a face-to-face course. Students could continue the process of learning uninterrupted, despite certain challenges that they faced. This served as a learning experience not only for me as an instructor, but also for the other students in the class, who had never had such an exposure to the diversity of their fellow classmates. Collaborative work was encouraged and assigned by the instructor, which led to students studying and collaborating outside the realm of the class. The grading scheme on the other hand was weighed differently from that of a face-to-face course. More emphasis was placed on the individual assignments rather than the on-line quizzes and exams, which were weighed, less than in a face-to-face class. Students that excelled in these classes were the ones who handed in assignments in a timely and consistent manner. The outcome measured by the students' performance when compared with those of the face-to-face classes, did not vary much in terms of numerical grades. I am currently tracking the results of the on-line class outcomes versus the face-to-face classes, and there is not enough data collected for me to report any conclusions in this area based on my experiences.

Conclusion

Based on my experience with developing, piloting and teaching of on-line courses, there are certain issues, which I would like to concur with. The initial process of setting up such a course is tedious and requires constant revision of content for errors or simple alterations. However, the pay back is that if you ever decide to teach it again, you spend much less time in preparation of content and design, not unlike a face-to-face class. Such a class requires changes in the way you are used to doing things in the classroom, as on-line students' needs are not all the same as those of a face-to-face class. A regular face-to-face class cannot be simply "made" into an on-line version, if you have certain desired outcomes. Sometimes our expectations and assumptions of our students' knowledge are totally wrong, and then we become suddenly enlightened by either a test or an in-class discussion. Similarly, with an on-line class, I have been wrong in my assumptions of students' technology experience. The pilot was a good experience for me as I did have students input as to how to better this alternate mode of delivery, which made things easier for their peers who were totally on-line. Start with an "inch", in the classroom with your face-to-face students. The journey to the "mile" will be less tedious as your knowledge gained by the "inch" will be priceless.

References

Armstrong, K. B. & Timm, S. A. (2000). *Business Education Forum. Effective Communication in the Diverse Classroom and Beyond* (pp. 16 – 17). VA: NBEA.

Goodson, C. (1997). *The Journal of Library Services for Distance Education. I Have Seen The Future: And It Is Us.* GA: State University of West Georgia.

Jones, K. A. (2000). *Keying In. Incorporating Technology Into Your Teaching Strategies* (pp. 4). VA: NBEA.

Matthews, D. (1999). *Technological Horizons In Education Journal. The Origins of Distance Education and its use in the United States* (pp. 54 – 67). CA: T.H.E.

Acknowledgement

This development of on-line courses was facilitated by a fellowship from the University System of Georgia granted to faculty at Georgia Perimeter College. The author being one such recipient was able

to conduct the development, pilot and teaching of these classes. All information contained in this paper is a reflection of the authors own experiences and views expressed are solely the responsibility of the author.

Real Concerns on Distance Education When Distance is a Reality

Leo Wells
Technology Research Consultant
San Angelo, TX USA
camelpower@yahoo.com

Abstract: The study from which this report was derived explored concerns of school change facilitators (superintendents, principals, and technology coordinators) as they implemented new curricular requirements for instructional technology. This present report focused on one strand of concerns: distance education. Six informants expressed hesitation over the impending interactive video labs which were to be installed in their school districts, primarily over bad experiences from previous efforts in distance learning. Each informant expressed hope that the new systems would be useful. There appears to be the need for balance as the positive aspects of distance systems (service, teaching) are implemented against the negative aspects of distance systems (teaching changes, impersonalness).

Introduction

Distance education is a reality, continuing to be a growing factor in education, and has become the de facto focus of instructional design programs at the university level. From courses in audio visuals, to BASIC and Logo programming, to applications work, and now to teaching by means of the World Wide Web, the change in what topics need to be considered in instructional technology have morphed over my professional life, and those changes are recognized in the literature. (Becker, 1998; Cuban, 1986) In their ubiquity, distance systems are simply assumed to be the norm.

This writer has visited with many collegiate education departments, each of which believe that they are the true pioneers in distance technology, when, in fact, they are using one of a handful of commercial products which promise ease of course delivery. Noble (1997) suggests ulterior motives in promulgating distance delivery within universities and schools in their collaborations with private industry, resulting in outside control over academics in exchange for providing capital improvements.

At any rate, a cursory look at professional journals from 1998 forward reveal a preponderance of discussions over every "hot" distance topic. Notwithstanding Noble, energetic research is being conducted over instructional design for websites (Coppola & Thomas, 2000; Firdyiwek, 1999; Huang, 2000; Ingram, 2000; Maddux, 1999; Price, 1999; Smaldino, 1999), evaluation of web courses (Kubala, 1998; Kubala, 2000; Rankin, 2000), and practical and administrative concerns (Cornell, 1999; Eastmond & Lawrence, 1998; Harmon & Jones, 1999; Hawkes & Cambre, 2000; Schifter, 2000; Swartz & Biggs, 1999; Wade, 1999; Wynia, 2000; Zhang, 1999).

This writer's earlier study explored concerns of school change facilitators during the implementation of a comprehensive statewide curriculum which included specifics on technology applications. (Wells, 1999) Concerns articulated by the study's informants included several themes, such as student learning, finances, and power, but concerns over distance education, past and future, appeared to be dominant and strong. This present report centers and expands on the concerns over distance education that these informants expressed.

Context for the Study

This study was conducted with those designated as "change facilitators" in a seven-district technology consortium in rural Texas. Two of the districts declined to participate in this research. These districts were rural, but possessed school leaders who were committed to bring their communities up to date with technology.

In general, each of the five school districts were in Texas counties which have declined in population since 1990. The combined population of these districts is 7,306 (Texas Almanac, 1998). Each district's economy was based on agriculture and varying amounts of mineral wealth, resulting in substantial difference in property values.

Telephone interviews were conducted by this writer with three each of school superintendents, building principals, and district technology coordinators scattered among five of the consortium districts. Pseudonyms are given for each of these participants in this present report. Interview data was analyzed and organized to reflect patterns or "themes" which emerged from the data (Bogdan & Biklen, 1992). Bogdan and Biklen further suggest that this method of sorting piles of coded data allows the researcher to make better sense of the data and communicate the results to others.

The Salt Fork Educational Technology Consortium (the Consortium) is comprised of seven independent school districts, all of which have worked together as a special education cooperative. Six of these districts are members of Educational Service Center (ESC) Region J, while one is actually in the territory of ESC Region K. As also with special education cooperatives, a technology consortium is an "interlocal agreement" by Texas law, and has a management board comprised of district superintendents, one district designated as fiscal agent, and a chair, authorized to speak and act for the group.

The Salt Fork Telephone Company (SFTC), headquartered in Dellwood, Texas, provides telephone service for several counties in Texas. All of the school districts in these counties depend on this provider for telephone service and the possibility of Internet connectivity. In 1995, the SFTC invited school leaders from their service area to a demonstration in Dellwood to demonstrate a variety of new technologies that they were excited to announce, particularly their new capability for two-way interactive video. Because these districts had worked together before, had a common telephone carrier, and had common interests, these school leaders concluded it practical to combine together for technology improvement in their schools.

Prior to the Consortium's establishment, member districts were limited to the computers they had in the classroom. Almost all of their computers were stand-alone units. Each district also had a satellite dish for the state network materials, but were using them poorly and inefficiently.

The Consortium keeps operating funds in a bank account separate from general operating funds, administered by the business manager of the fiscal agent. To date, funding has come from grants, and from moneys generated from the two member districts designated as "property-wealthy" under Chapter 41 of the Texas Education Code. These districts recapture a certain percentage of excess property wealth normally surrendered to the State and assign those funds to the Consortium. These districts have voluntarily chosen to redistribute their funds in this manner.

Because these districts have formed this Consortium, they not only have more technology, but also more capabilities. As a whole, there is improved student performance and better trained teachers, with a rise in school accountability scores. Most importantly, these school leaders function as a group. They actively seek ways to collaborate.

A recent example of this improved outlook on technology concerns teachers' use of the Accelerated Reader (AR) program. Heretofore, it had been difficult to get teachers to travel all the way to Center City for training for AR, but with a high-quality technology center in Dellwood, closer to the other Consortium member schools, there was high and enthusiastic turnout for the training sessions.

Informant Concerns

Because the Consortium is implementing a highly sophisticated distance learning center in each of its member schools, each informant eagerly volunteered concerns over its implementation, use, and outcomes. The very concept of "distance," however, is not simply limited to "distance learning," but also to the significant distances Consortium educators have between their schools and sources of school improvement.

These informants perceived improvement for their school districts by being able to bring a greater variety of activities and services to their districts. Charlie Clark, a superintendent, jumps at the chance to use distance learning in his district. He sees benefits in distance learning to both professional and student progress, as well as it being a cost-cutting measure:

> I think it's going to be extremely beneficial, especially to schools out here, like we are, that, you know, we're an hour and a half away from the Service Center, or from Center City, or Tech, or anywhere like that, and it'll be extremely beneficial to our students. You know we can pick up some college classes. We can get them some dual-credit classes. I've got some people here that want to take some classes and want to work on some graduate work, and so forth, that maybe we can pick up. School board training and in-service training through the Service Center will save us lots of dollars and lots of time, because if we don't have to travel all the way to Center City to get our in-service, and even if it's a half-a-day deal, you spend a whole day by the time you drive over there and drive back.

Tim Booth, another superintendent, agrees with Charlie's concern over literal distance from school to service center. When staff have to do as much travel as do these school leaders, distance becomes a significant factor in what they can accomplish:

> We're so isolated. We're a hundred miles from Center City, which is where our Service Center is. . . Instead of travel time, you know, because any teacher who leaves here loses a full day, even if it's an hour workshop.

Denise Stevens, a teacher/technology coordinator, echoes Tim's concerns. She experiences the pressure of the distance crunch as she budgets her time and resources:

> We live a hundred miles from any kind of technical support, and we pay $100.00 an hour for somebody to come out and fix it, so you think twice before you even ask to have (a computer) looked at. Can I work around this?

Nevertheless, there is a sense of concern registered by each informant over distance learning implementation. There is also a fear of technology supplanting the teacher's role. Craig Henry sees distance learning in his professional future, but also makes this prediction:

> My first instinct is to say that probably distance education is going to have effect particularly on rural America. I'm not real sure I'm ready to buy that yet. It may, but I'm not totally yet sold on distance learning as a tool for replacing the teacher in the classroom. There may come a day that that might be the only way that we can deliver some instruction to our students. If and when that day comes, I think that's going to be a shame, and I think that's going to be a step back in education.

Previous efforts with distance learning were frustrating at some informants' schools. Craig registers his experiences:

> And (distance learning) wasn't that well received, either from the students or the parents. And I know that distance learning will be better than that because you'll have two-way interactive audio and video at all times. But I still have reservations, and I'll have to see it work well to change my mind on it. I probably can't stop it from coming.

Arnold Brady, having been a distance learning facilitator, also remembers problems with this teaching format for students and facilitator alike:

> But it was all these schools, even as far away as Kansas that were viewing this at the same time. And it's hard to get through on the telephone line because you had all these people trying to get through to ask a question.

When asked about the net effects of all this, Arnold explained:

> We had a lot of, I guess you'd say, disillusioned parents and kids because they were expecting to get, you know, they thought, "What a wonderful way to be in touch with computers," and what have you. And, you know, if we did work, we had to bundle that work up, send it to San Antonio. Well, by the time the guy got it graded, and got it back, you know, it might be a week or two. . . . And at the same time, we were under "no pass no play" rules. And you had athletes that, you know, at three-week's reporting period, didn't know if they were passing or not. And then some of them would wind up failing at the end, and they didn't even really know why they were failing. And so, you know, we had a bunch of kids that were, like, ineligible.

Frustrations registered by the adult facilitators were received clearly, but students' responses to the distance experience were even worse. Arnold elaborated in detail about the "legwork" done on-site to facilitate distance learning. As is axiomatic in instructional design, inadequate feedback does not promote learning:

> The kids never really knew for sure if what they were doing was what he wanted or what was acceptable, or till he had a chance to mark it, and write notes on it and what have you. And a lot of times, by the time they did get feedback on it, well, it was too late.

Denise also experienced first-hand the details of distance learning. Concerning the possibilities of interactive video, Denise questions:

> I guess the biggest concern has been teachers who are afraid that they will get dumped on. How many students are you going to expect me to teach for this class that I have the same prep time that I had when I had seven kids?. . .And then all of a sudden, I'm teaching an interactive video classroom where I have kids from Woodlake, and from Dellwood, and from Beaverdam, and from Sawtooth, and all of a sudden, I have fifty kids instead of fifteen. I'm given the same amount of prep time, or maybe I'm given a second hour of prep. I still have the logistics of having to be ready for however many my school district decides to contract for. And, I have to be eminently more prepared that I ever thought about having to be prepared in a normal classroom. Because I can't go on the air and expect to freestyle it, you know?

Denise, a technology coordinator, as well as a classroom teacher, brings distance learning down to earth with her practical concerns. Contrasting with the concerns of teachers over the years, distance learning is bringing in new, heretofore unanticipated concerns and challenges. Denise relates:

> You know when we just had textbooks, the worst problem you had to deal with was with the student who showed up in class without their books, or, you ran out of chalk, and you sent somebody down to the office to get chalk. But when you start using these levels of technology where the bugs are not quite as worked out, then you not only run into, you run into problems using the technology that really can crush your class time and crush your prep time.

Charlie Clark concurs adding:

> It's another one of those things that, a new toy, that's going to be helpful, it's going to be beneficial, but it's going to be another one of those things that we've got to learn to USE too. We don't want just the the stuff put in, we want to be able to use it when we get it. We've got to stay on top of it. . . But if we don't stay on top of it, it won't take long to get behind.

As a superintendent, Charlie knows that he has to get the maximum "bang for the buck" as he works with his school board in defending the cost from distance education.

George Richards is adamant in his dislike for distance learning. Suggesting that distance learning might not be a good way to learn, George augments this with more mundane administrative concerns. Since George perceives the teacher role in a traditional manner, he has concern over classroom discipline in a distance learning format:

> Well, I don't think you're going to have any kind of classroom without discipline in the class. And the only person that can do that is the one that is supposedly in charge, the one that's taking care of grades, etc. So that teacher has almost got to see her classroom.

This writer wonders whether George perceives distance education appropriately when he asserts concerning his evaluation of a distance education class:

> You know you have a facilitator. Your class can be strengthened by an excellent facilitator, but there's not any "school" going on. I guess to use the word "waste" of a certified teacher there. Sometimes, it's going to be an aide, somebody that will take care of the business, take care of mailing it off, getting everything in, and kind of keeping the students halfway quite. But it's not like anything like a good teacher would do, and because of this and because of the distance, it's a very slow pace.

Summary and Conclusions

The notion that technology could bring about needed opportunities and services to remote sites by distance learning has been discussed for some time and is now standard for evaluating a school's technology program (Becker, 1998; Texas Association of School Administrators, 1998). Nevertheless, there appears to be a need for a semblance of balance as the positive elements of distance learning (services, teaching, physical distance needs, etc.) are weighed against the pitfalls (teaching method changes, impersonal relationships) of these new technologies (Berg, Benz, Lasley, & Raisch, 1997; Dillon & Walsh, 1997). The apprehensions of Consortium change facilitators toward the impending interactive video system were quite real. They saw potential for some yet unknown distracting factor causing havoc with the learning process as a result of distance learning. At least one informant voiced active disagreement with distance as a viable means of teaching and learning.

Nevertheless, the Salt Fork administrators know that this is necessary for their students. Charlie Clark sums up the attitude of Salt Fork school leaders when he says:

> Our main goal is to make sure that when our kids leave here, they've got just as good an education as someone coming out of Central City or Riverton or Houston or wherever, and that they can just fall right in there, and get with the program, and they don't feel like they're behind in anything. . . . Let's live out in the country, but let's get out of it at the same time and make sure we're on top of the world, here, and we know what's going on.

References

Becker, H. J. (1998). Running to catch a moving train: Schools and information technologies. *Theory Into Practice, 37*(1), 20-30.

Berg, S., Benz, C. R., Lasley, T. J., & Raisch, C. D. (1998). Exemplary technology use in elementary classrooms. *Journal of Research on Computing in Education, 31*(2), 111-122.

Bogdan, R. C., & Biklen, S. K. (1992). *Qualitative research for education: An introduction to theory and methods* (2nd. ed.). Boston: Allyn & Bacon.

Coppola, J. F., & Thomas, B. A. (2000). Beyond "chalk and talk": A model for e-classroom design. *T. H. E. Journal, 27*(6), 30-36.

Cornell, R. (1999). The onrush of technology in education: The professor's new dilemma. *Educational Technology, 39*(3), 60-64.

Cuban, L. (1986). *Teachers and machines: The classroom use of technology since 1920.* New York: Teachers College Press.

Eastmond, D. V., & Lawrence, B. H. (1998). Instructing faculty to develop and deliver distances courses with computer network technology. *Journal of Educational Technology Systems, 26*(4), 315-324.

Firdyiwek, Y. (1999). Web-based courseware tools: Where is the pedagogy? *Educational Technology, 39*(1), 29-34.

Harmon, S. W., & Jones, M. G. (1999). The five levels of web use in education: Factors to consider in planning online courses. *Educational Technology, 39*(6), 28-32.

Hawkes, M., & Cambre, M. (2000). The cost factor: When is interactive distance technology justifiable. *T. H. E. Journal, 28*(1), 26-32.

Huang, H. (2000). Instructional technologies facilitating online courses. *Educational Technology, 40*(4), 41-46.

Ingram, A. L. (2000). The four levels of website development expertise. *Educational Technology, 40*(3), 20-28.

Kubala, T. (1998). Addressing student needs: Teaching on the Internet. *T. H. E. Journal, 25*(8), 71-74.

Kubala, T. (2000). Teaching community college faculty members on the Internet. *Community College Journal of Research and Practice, 24*(5), 331-339.

Maddux, C. D. (1999). A university class in web design for teachers: Content and rationale. Paper presented at the Association for the Advancement of Computing in Education Conference, San Antonio, TX.

Noble, D. F. (1997). Digital diploma mills, part I: The automation of higher education. [online] URL: http://www.communication.ucsd.edu/dl/

Price, R. V. (1999). Designing a college web-based course using a modified personalized system of instruction (PSI) model. *TechTrends, 43*(5), 23- 28.

Rankin, W. (2000). A survey of course websites and online syllabi. *Educational Technology, 40*(2), 38-42.

Schifter, C. C. (2000). Faculty motivators and inhibitors for participation in distance education. *Educational Technology, 40*(2), 43-46.

Smaldino, S. (1999). Instructional design for distance education. *TechTrends, 43*(5), 9-13.

Swartz, J. D., & Biggs, B. (1999). Technology, time, and space or what does it mean to be present? A study of the culture of a distance education class. *Journal of Educational Computing Research, 20*(1), 71-85.

Texas Association of School Administrators, (1998). *Texas public school technology survey*. [online] URL: http://www.coe.tamu.edu/~texas/techsurvey.

Wade, W. (1999). What do students know and how do we know that they know it? *T. H. E. Journal, 27*(3), 94-100.

Wells, G. G. (1999). *Leadership concerns about the implementation of the Texas Essential Knowledge and Skills (TEKS) for Technology Applications*. Unpublished doctoral dissertation, Texas Tech University, Lubbock, TX.

Wynia, L. (2000). How do students really feel about interactive television? *TechTrends, 44*(4), 39-41.

Zhang, P. (1999). A case study on technology use in distance learning. *Journal of Research on Computing in Education, 30*(4), 398-419.

Does Distance Education Resolve The Current Problems of Education?

Ya-Ting Carolyn Yang
School of Education
Purdue University
United States
yangyc@purdue.edu

Timothy J. Newby
School of Education
Purdue University
United States
newby@purdue.edu

Abstract: Distance education has come of age. Its foundations have become firmer, its applications have grown in number and variety, and its influence has become more visible and more substantive. Yet, one question is still frequently raised: "Does distance education resolve the current problems of education?" This paper aims at giving some answers to this question by investigating the benefits and challenges of distance education. What follows is a thorough discussion of the question. Finally, suggestions are made for further research in the field of distance education to improve the current educational system.

Introduction

Current trends in education reflect an expansion from on-campus education toward distance education. These trends have been evident in the exponential growth of papers published during the 1990s. As Willis (1998) mentioned, distance education, a section that did not exist prior to 1996, is now one of the largest sections in the Society for Information Technology and Teacher Education (SITE) annual conference. A review of the literature, however, found few studies directly addressing the effect of distance education with considerations of the current problems of education. If we understand which aspects of distance education resolve the current problems and which do not, we could then focus our attention to the unsolved problems in forthcoming research efforts to hasten the pace of improvement. Three main problems of current education discussed in this paper are what we regard as the root of many of the key problems facing education today. They are unequal learning opportunities, the change of demographics, and the lack of individualism.

Current Problems of Education

Unequal Learning Opportunities

People in rural or remote locations, as well as those in economically challenged districts, are often at a disadvantage educationally compared with those in well financed urban areas. Resources may be scarce, and, in the worst cases, there may not be enough teachers to reach the students. For example, a small, rural school may not be able to justify the cost of a teacher to provide advanced physics instruction or teach Japanese to a handful of students. Problems of access may be manifested in other ways as well. For example, learners who are homebound due to illness or physical disability may not be located far from an educational institution, but they are effectively isolated. Adults who wish to pursue education may lack the time needed to pursue current coursework at a local school or college. For them, home study may be the only option. Distance education can overcome many of these problems of access and provide educational opportunities (Newby, *et al.*, 2000).

The Change of Demographics

With the disappearance of jobs the workplace is changing, workers require retraining in new jobs that require new skill sets to help revitalize businesses in a competitive marketplace. This resulted in colleges and universities in the United States being faced with tremendous challenges in the 1990s. During this time the traditional 18-21 years old students, who lived on campus while taking courses full time, shifted to students who lived away from campus, had families and jobs and either commuted to campus or looked for distance education alternatives (Hiltz, 1994). A rapidly growing population with increased workplace changes means the traditional methods of on-campus education may leave out many potential students from gaining a full educational experience.

Lack of Individualism

One aspect of education that must be considered is that all students are DIFFERENT, with different backgrounds, knowledge, interests and learning styles. Each student should be treated individually (Bork, 1997). But current modes of learning of instructor-led lecture and textbook provide little individualization. Every student tends to be provided with the same learning experiences. This cookie-cutter approach to learning works for a few students, but many learn only partially without maximizing their potential.

Benefits and Challenges of Distance Education

In order to clearly present the benefits and challenges of distance education, the benefits are classified into eight categories—access, reach, heterogeneous opinions, flexibility, convenience, comfort of learning, quality of learning, and learner focus. Conversely, the challenges are grouped into five categories—the emphasis on the hype and hoopla of technology, feelings of isolation, cost of equipment and technology, low quality of individualization, and inadequate student support systems.

Benefits of Distance Education

a) ***Access***—Distance education addresses the problem of unequal learning opportunities in terms of the educational access. It provides service to students who are geographically isolated or who are otherwise place-bound or time-bound, such as people who have physical disabilities and/or working professionals who seek educational opportunities for reasons of career advancement. Distance learning opens up possibilities for non-traditional students who limited on-campus access due to time or distance issues.

b) ***Reach***—The problem of unequal learning opportunities in terms of insufficient funds or resources to open the wanted course for students in a small or rural school can also be solved by distance education. As the example given above, a small, rural school may not be able to justify the cost of a teacher to provide advanced physics instruction or teach foreign languages to a handful of students. Expanding geographic reach through distance education gives an institution a wider pool of students from which to recruit. This could benefit most resident educational institutions, for some of which, this may be a useful tactic to maintain or expand general student enrollments. For others, distance education may be used to recruit students into specialized courses or programs in which a critical mass cannot be maintained on-campus (Smith, 1998).

c) ***Heterogeneous Opinions***—Because distance education gives an institution an opportunity to recruit a wider pool of students, it is expected that students who come from different populations/areas/countries or from different disciplines could provide more heterogeneous perspectives to the topics or problems discussed in class. According to Whitworth (1999), many students felt that the educational experience was enriched by their collaboration with other students from different locations because they have learned just as much material and actually gained more ideas than they would have in a current class setting by listening to and watching the presentations of other students from so many different backgrounds.

d) ***Flexibility***—Smith (1998) pointed out that for faculty, increased flexibility can allow for meeting classes from a distance while traveling, for lecture opportunities, and for maximizing time efficiency in research. For students especially with part-time or full-time jobs, distance education tactics can enhance student efficiency with time shifting within a semester and load leveling within a curriculum, allowing students to take required courses that may only be offered at a certain time of day or in a certain semester. This flexibility may decrease time to graduation and allow students time for extracurricular activities. In business, with a shrinking workforce and the rapid changes in technology, distance education can be employed as a strategy to overcome the internal "content-expert" shortages.

e) ***Convenience***—With the availability of on-line interaction and content support twenty-four hours a day, convenience is another salient aspect of distance education. In today's busy environment, highly mobile learners are requesting equally mobile and time-flexible delivery. The current emphasis on desktop conferencing and asynchronous learning are responses to this need for convenience, so that the learners may take responsibility for the pace of learning, with freedom to start and stop at any time.

According to Smith (1998), distance education technology can provide more detailed needs assessment and more frequent checks and revisions for instructional designers and/or instructors. For example, course delivery through the Web by using WebCT (*http://www.webct.com)*—full-featured packages for on-line courses, allows the instructor to efficiently track students' progress throughout the course and immediately provides the instructor statistical reports of students' performance. These results can supply the instructor useful information in redesigning his/her instruction. In addition, since much of distance education is documented in e-mails, LISTSERVs and chat rooms, it is more convenient for researchers to study the communication and instructional processes of it.

f) ***Comfort of Learning***—Participating in class online allows students and instructors the ease to participate from a computer lab or the comfort of their own home. This is especially beneficial for learners who have illness or physical disability.

g) ***Quality of Learning***—Distance education could maintain or improve instructional quality by providing variety and depth of course offerings within a curriculum, multi-campus graduate seminars, and seminars with industry and government research sponsors. These courses are particularly important in graduate program and can be achieved by using some common techniques, such as videoconferencing and computer communications, as well as audioconferencing.

Educational outcomes of individual courses could also be improved through distance learning. Distance education techniques can support many educational strategies for individual courses to enhance quality. It can allow team teaching with colleagues from other universities. Benchmarking—a frequent quality improvement strategy in education and business—can be facilitated through distance education. Telecommunications technology can connect students with the real world through speakers, experience, and events. These technologies and the Internet can be used to improve contact and access, as well as reduce travel, thus providing new opportunities for students. Examples include supporting interns and residents in field placements, supporting graduate students in industry research placements, and providing contact for industry researchers on campus (Smith, 1998). In addition, in order to take distance courses, students need to learn the required technology skills that will provide them with the everyday information technology skills they will need in their future study, work and life.

h) ***Learner Focus***—Universities have traditionally been teacher-centered rather than learner-centered, with an emphasis on knowledge dissemination through one-way lectures and "chalk-and-talk" methods. Perhaps because teaching is less readily taken for granted when students are separated overtly by time and/or distance from the instructor, the emphasis in distance education programs has been more on the learner and on learning. Moreover, one of the advantages of classroom teaching has supposedly been the interpersonal contact between teacher and student. This has increasingly been lost, as class sizes have grown rapidly, yet there has been little adaptation to the "distance" this introduces. At least in distance education the distance is overt, perhaps necessitating more comprehensive efforts to compensate for it (Tobin, 1995).

Challenges of Distance Education

a) ***Hype and Hoopla of Technology***—Computer technology has been used in learning environments since the late 1950s, with increasing amounts of money going in this direction. Looking nationally and internationally, it is difficult to see that this usage has improved learning performance for most students (Bork, 1997). According to many practitioners in distance learning, it is very easy to get "caught up" in the new technologies, which results in a class that is driven by the technology itself rather than by the use of technology to enhance learning performance. This might be the reason the performance of learning in some distance learning programs has not been improved as expected when technology has been used as an aid for the instruction. Educators should be careful about the "seductive allure" of gee-whiz technology and not lose sight of designing effective instruction.

Additionally, teaching instructors and students how to use equipment and software packages can often take too much time away from course content. It is recommended by Whitworth (1999) that this problem be alleviated through separate workshops and help sessions focusing solely on the technology that are supported or sponsored by the college or university.

The problems of the possibility of a technology failure are seldom mentioned. Experience has shown that the likelihood of such an occurrence diminishes with the quality of the equipment. The problems associated with the system in Whitworth's study (1999) mainly occurred at sites that economized by purchasing less expensive microphones, monitors, and cameras. But even with quality equipment, problems can occur. Therefore, it is essential to have a back-up plan and an alternate lesson that site facilitators can deliver to students.

b) ***The Feelings of Isolation***—In a learning situation in which the instructor is not physically present, it is easy for both the students and the instructor to feel isolated from each other. Many students feel that relying on non-personal interaction as a (sole) source is inefficient when compared to human interaction and results in the feelings of isolation. Many instructors feel that it is hard to orchestrate unity among classmates in different distance learning labs. The following entry from the instructor's journal details her impressions after the first encounter with a real distance learning class: "I felt good about the class, but I felt removed from my students. Unless I call on a specific site there is no feedback or response. I felt so alone and the equipment makes a physical barrier between the students and me in the room. This feeling of isolation continued to be a problem for the instruction throughout the semester" (Whitworth, 1999). Therefore, creating a feeling of community to provide a social contact and increase the interactivity between the instructor and students and among students is one of the most important issues that educators should be aware of while teaching at a distance.

c) ***Cost of Equipment and Technology***—According to a study conducted by the U.S. Department of Education in 1995, among the factors frequently reported as keeping instructions from starting or expanding their distance education courses offerings to a "major extent" were program development costs (43%), limited technological infrastructure (31%), and equipment failures and costs of maintaining equipment (23%). It is true that the economies of scale could be achieved once a certain number of students enrolled have been obtained or classes have been taught repeatedly over an extended period of time so that the high fixed cost of equipment and technology can be shared to hundreds of students or over a number of years. However, the setup cost for the required equipment and technology, such as computers, virtual libraries, central servers and networks, ongoing technical support, program development costs, and marketing, for distance learning classrooms can still be substantial. The funding has to be there!

In many institutions, there is limited technological infrastructure to support distance education (Lewis, *et al.*, 1997). Communication systems used to support distance education can be unreliable (Hall, 1995) and equipment failures numerous (Matthews, 1999). Maintenance and repair bills for distance labs are high. Without proper maintenance, many equipment problems, such as poor reception, busy phone lines, and broken hardware, can result in downtime and canceled classes.

d) ***Low Quality of Individualization***—Although our students are all very different, almost all the curriculum approaches we have now (books and lectures) treat them alike. Thus, it is not too surprising that existing computer learning material does the same. We need learning that is individualized to the needs of each student. The key to achieving effective learning is to use the interactive capabilities of modern computers (Bork, 1997). Unfortunately, current attempts, such as putting courses on the World Wide Web, differ only slightly from books and have not fulfilled the individualized learning that we need.

c) ***Inadequate Student Support Systems***—McInnis-Rankin and Brindley (1986) described that student support services could include orientation and information, administrations and other registry services, advising and counseling, instructional support, and student advocacy. Distance education institutions, such as the Open University in the United Kingdom, have well-developed student support systems to serve the distance student (Koble and Bunker, 1997). However, distance education for Americans was almost synonymous with new technologies and their applications to learning—using computers, interactive video, and even virtual reality (Paul 1995). Paul also mentioned that when compared to the European counterparts, Americans were less interested in course design or student support, and were somewhat indifferent to the linguistic debates about the relative meanings of open learning and distance education, which received considerable attention at that time in Open Learning, the journal of the Open University in Britain. Paul's criticism can be justified by the research conducted by Koble and Bunker. In their journal—Trends in Research and Practice: An Examination of "The American Journal of Distance Education" 1987 to 1995, Koble and Bunker pointed out that only three out of the 129 major refereed articles in American Journal of Distance Education from 1987 to 1995 belonged to student administration and support issue. The dearth of articles on student administration and support is disappointing. Institutions that are now developing distance education programs and new delivery systems must also begin establishing and standardizing admission procedures and support systems to accommodate distance learners. Just as recent articles in the journal indicate an increasing awareness of the role of the instructor in distance education, we would also hope to see an increase in the number of articles addressing student support issues, such as tutoring, counseling, and advising (Koble and Bunker, 1997).

Discussion

Three important problems of the current education—unequal learning opportunities, the change of demographics, and lack of individualism have been selected for the review in this paper. Distance learning is opening doors for populations previously unreachable by current education, such as place-bound or time-bound learners. With the aid of advanced technology, it is believed that the problem of unequal learning opportunities could be resolved by distance learning in the near future. While conventional universities are geared primarily to serving younger full-time students, an emphasis on lifelong learning suggests an increasing interest in older, part-time learners, the primary target group for most distance-based programs. With its relative flexibility and convenience, distance education meets the needs for the changing demographics and, thus, can accommodate the influx of nontraditional learners, such as working professionals who have family obligations, limited free time, and career/civic responsibilities. However, the third problem of the current education—lack of individualism has not yet been achieved by distance education. Research on how to incorporate the technology to design the seamless instruction that meets the individual student needs and maximizes the potential of each student should be further conducted.

Although many of today's education problems can be overcome by distance education, it also brings up some new problems, such as higher dropout rate. The main reason for higher attrition in distance education might be caused by the inadequate student support services. This concern should be set forth and manifested in the development of a wide variety of student support services in American distance teaching institutions to assist students coping with learning difficulties in distance education. In addition, Tobin (1995) claims that, "Research with students…indicates that their successes is closely tied to the provision of these services." Moore (1996) has suggested that, "There is a direct relationship between the instructional effectiveness of a program and the time and money spent on learner support [italics removed]."

Many distance education practitioners noticed that the frenzy of activity relating to the Internet and teleconferencing technologies has produced pressure to rush into distance education without proper planning, which results in overlooking the real purpose of using technology as an aid to enhance learner performance. Thus, the performance of distant learners is not achieved as expected for some distance learning programs. Hence, rather than being "caught up" by the new the technologies, educators should focus their attention back to where it belongs--careful planning, a focused understanding of course requirements and student needs, and the awareness of the limits of distance education, such as the feelings of isolation, which might cause the problem of lacking of student persistence and lower student performance. After all, technology doesn't teach. People do! Only with proper instructional design—planning, implementing, and evaluating (Newby, *et al.*, 2000), and the wise selection of reliable learning methods and appropriate instructional strategies specifically tailored for distance learning to cope with the challenges of it, distance education can provide a convenient and instructionally sound method of course delivery.

Conclusion

With the help of advanced technology, such as the Internet and World Wide Web, which can do many wonderful things for distant learners, distant education provides us a promising solution to cope with the current educational problems, such as unequal learning opportunities and the changing demographics of learners. However, lack of individualism has not yet been achieved by distance education and the solution to it is waiting for us to further explore. To sum up, teaching from a distance is challenging; an effective distance education program does not happen spontaneously. Distance learning requires hard work and commitment on the part of the instructor and students who are willing to give it a chance and a support system from the institution that sponsors it. With a well-organized planning process, distance education will have its rewards—better access, better quality, more flexibility and convenience, and hopefully in the "not-so-distant" days, better individualized education to maximize student performance!

References

Bork, A. (1997). The future of computers and learning. *T.H.E. Journal*, 24 (11), 69-77.

Koble, M. & Bunker, E. (1997). Trends in research and practice: An examination of "The American Journal of Distance Education" 1987 to 1995. *The American Journal of Distance Education*, 11 (2), 19-38.

Hall, J. (1995). The convergence of means. *Educom Review*, 30 (4), 42-45.

Hiltz, S. (1994). *The virtual classroom: Learning without limits via computer network.* Norwood, NJ: Ablex Pub.Corp.

Lewis, L., Farris, E., & Alexander, D. (1997). Distance education in higher education. Statistical Analysis Report. Postsecondary Education (Report No. NCES-98-062). Westat, Inc., Rockville, MD. (ERIC document No. ED 413 829)

Matthews, D. (1999). The origins of distance education and its use in the United States. *T.H.E. Journal*, 27 (2), 54-67.

McInnis-Rankin, E. & Brindley, J. (1986). In *Distance education in Canada*, ed. I. Mugridge & D. Kaufman, 60-80. London: Croom Helm, Limited.

Moore, M. (1996). Tips for the manager setting up a distance education program. *The American Journal of Distance Education*, 10 (1), 1-5.

Newby, T. J., Stepich, D. A., Lehman, J. D., & Russell, J. D. (2000). *Instructional technology for teaching and learning: Designing instruction, integrating computers, and using media.* Columbus, OH: Merrill, an imprint of Prentice-Hall.

Paul, R. (1995). Virtual realities or fantasies? Technology and the future of distance education. In *Why the information highway?* ed. J. M. Roberts and E. M. Keough, 126-145. Toronto: Trifolum Books.

Smith, T. (1998). Distance education is a strategy: What is the objective? *The American Journal of Distance Education*, 12 (2), 63-72.

Tobin, J. (1995). Evaluation and research frontiers: What do we need to know? In *Why the information highway?* ed. J. M. Roberts and E. M. Keough, 201-225. Toronto: Trifolum Books.

U.S. Department of Education. (1995). Survey on distance education courses offered by higher education institutions. National Center for Education Statistics. Postsecondary Education Quick Information System.

Whitworth, J. (1999). Looking at distance learning through both ends of the camera. *The American Journal of Distance Education*, 13 (2), 64-73.

Willis, J. (1998). Distance education. *SITE, 1998*, Association for the Achievement of Computing in Education, Washington, DC. Available URL: http://www.coe.uh.edu/insite/elec_pub/HTML1998/de_edit.htm